APR/FY06

REDSTONE ARSENAL

Alabama

Army Defense Environmental Restoration Program Installation Action Plan

Final 5 September 2006

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multi-year Cleanup Program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern, and proposes a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations and necessary remedial actions.

In an effort to coordinate planning information between the restoration manager, US Army Environmental Center (USAEC), Redstone Arsenal, executing agencies and regulatory agencies an IAP was completed. The IAP is used to track requirements, schedules and tentative budgets for all Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

The following agencies contributed to the formulation and completion of this Installation Action Plan during a planning workshop held on 10-13 April:

Company/Installation/Branch
ADEM
AMTEC for Redstone Arsenal
EEI for USAEC
Redstone Arsenal
Shaw E&I for Redstone Arsenal
US Army Corps of Engineers
USAEC
US Environmental Protection Agency

Acronyms & Abbreviations

~	approximate
A/I	*used in MMRP Contamination Assessment*
AAFES	Army Air Force Exchange Services
ABMA	Army Ballistic Missile Agency
ADEM	Alabama Department of Environmental Management
AEC	(United States) Army Environmental Command
AEDB-R	Army Environmental Database - Restoration
AMCOM	Army Aviation and Missile Command
ARBCA	Alabama Risk-Based Corrective Action
ARS	Advance Range Survey
AST	Above Ground Storage Tank
ATCOM	Aviation and Troop Command
ATSDR	Agency for Toxic Substances and Disease Registry
Bldg	building
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethyl Benzene, and Xylene
C&D	Construction and Demolition
CAIS	Chemical Agent Identification Set
CAP	Corrective Action Plan
CC	Compliance-Related Cleanup
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CG	chlorine phosgene
CN	tear gas
COPC	Chemical of Potential Concern
CSM	Chemical Surety Material or Conceptual Site Model
CTC	Cost-To-Complete
CTT	Closed, Transferred, or Transferring
CVAA	Chloro Vinyl Arsenous Acid, a breakdown product of Lewisite
CWM	Chemical Warfare Material
cy	cubic yards
DD	Decision Document
DDD/DDE/DDT	Type of pesticide and its breakdown products
DERP	Defense Environmental Restoration Program (now called ER,A)
D-NAPL	Dense Non-Aqueous Phase Liquid
DM	Vomit gas
DMM	Discarded Military Munitions
DOD	Department of Defense
DOT	Department of Transportation
DPG	Defense Program Guidance
DRMO	Defense Reutilization and Marketing Office
EOD	Explosive Ordnance Division
EPA	(United States) Environmental Protection Agency
ER,A	Environmental Restoration, Army (formally called DERA)
ESE	Environmental Science & Engineering, Inc.
ESI	Expanded Site Inspection

Acronyms & Abbreviations

F&W	Fish and Wildlife
FFA	Federal Facilities Agreement
FS	Feasibility Study
FUDS	Formerly Used Defense Sites
Ft	foot or feet
FY	Fiscal Year
G&M	Geraghty & Miller
GAF	Government Aircraft Factory
GCD	Gulf Chemical Depot
GFP	Grenade Filling Plant
GIS	Geographic Information System
GW	Groundwater
H	mustard
HC	hexachloroethane
HDPE	High Density Polyethylene
HMX	type of explosive
HRC	Hydrogen Releasing Compound
HRS	Hazard Ranking Score
HSB	Huntsville Springs Branch
HVA	Huntsville Arsenal
IAP	Installation Action Plan
IBF	Incendiary Bomb Filled
IC	Indian Creek
ICF KE	ICF Kaiser Engineers, Inc.
IMP(C)	Implementation (Construction)
INV	Investigation
IOU	Integrator Operable Unit
IRA	Interim Remedial Action
IRFA	Interim RCRA Facility Assessment
IRP	Installation Restoration Program
ISC	Initial Site Characterization
ISP	International Specialty Products, Inc.
K	$1,000
L	lewisite
LDR	Land Disposal Restrictions
LNAPL	Light Non-Aqueous Phase Liquid
LSA	Limited Site Assessment
LTM	Long Term Management
LUC	Land Use Controls
MC	Munition Constituents
MEC	Munitions and Explosives of Concern
MICOM	Missile Command
MMRP	Military Munitions Response Program
MNA	Monitored Natural Attenuation
MOA	Memorandum of Agreement
MOCA	4,4-methylene-bis[2-chloroaniline

Acronyms & Abbreviations

MRS	Munitions Response Site
MSFC	Marshall Space Flight Center
MTBE	Gasoline additive
mg/Kg	Milligrams per kilogram
NA	Not Available
NAPL	Non-Aqueous Phase Liquid
NASA	National Aeronautics and Space Administration
NBA	Northern Burial Area
NDAA	National Defense Authorization Act
NE	Not Evaluated
NFA	No Further Action
NOV	Notice of Violation
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
NW	northwest
OB/OD	Open Burning/Open Detonation
O & M	Operation & Maintenance
OE	Ordnance & Explosives
OGMS	Ordnance Guided Missile Center
OMEMS	Ordnance Munitions and Electronics Maintenance School
ORAP	Operational Range Assessment Program
OU	Operable Unit
P & T	Pump and Treat
Parsons	Parsons Engineering-Science, Inc.
PA	Preliminary Assessment
PAH	Polynuclear Aromatic Hydrocarbons
PBC	Performance Based Contacting
PCB	Polychlorinated Biphenyls
PCE	Perchloroethylene
PF	Petroleum Free
POL	Petroleum, Oil & Lubricants
POW	Prisoner of War
PP	Proposed Plan
PRO	Petroleum Range Organic
PSA	Preliminary Site Assessment
PTSM	Principal Threat Source Material
PX	Post Exchange
R&D	Research & Development
RA	Remedial Action
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operation)
RAB	Restoration Advisory Board
RACER	Remedial Action Cost Engineering & Requirements System
RAGS	Risk Assessment Guidance for Superfund

Acronyms & Abbreviations

RARE Facility	Redstone Arsenal Rocket Engine Facility
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	type of explosive
REM	Removal
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy in Place
ROD	Record of Decision
ROP	Redstone Ordnance Plant
RR	Range Rule or Railroad
RRSE	Relative Risk Site Evaluation
RSA	Redstone Arsenal
RUST E&I	Rust Environmental & Infrastructure
SAIC	Scientific Applications International Corporation
sf	square feet
SI	Site Inspection
SMF	Smoke Manufacturing Facility
STP	Sewage Treatment Plant
STS	Space Transport System
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compounds
SW	Southwest
SWMU	Solid Waste Management Unit
TA	Test Area
TAPP	Technical Assistants for Public Participation
TC	thionyl chloride
TCA	Trichloroethane
TCRA	Time Critical Removal Action
TCE	Trichloroethylene
TI	Technical Impracticability
TN	Tennessee
TNT	type of explosive
TOW	Tube-Launched, Optically-Aimed, Wire Guided
TPH	Total Petroleum Hydrocarbons
TRC	Technical Review Committee
TSA	Temporary Storage Areas
TSCA	Toxic Substances Control Act
TVA	Tennessee Valley Authority
USAEC	United States Army Environmental Center
USATHMA	US Army Toxic and Hazardous Material Agency (replaced by AEC)
USEPA	United States Environmental Protection Agency
USGS	United Stated Geological Survey
UST	Underground Storage Tank

Acronyms & Abbreviations

UXO	Unexploded Ordnance
VOC	Volatile Organic Compounds
VSI	Visual Site Inspection
WEHAA	Wetlands Ecological Habitat Assessment Area
WMM	Waste Military Munitions
WP	white phosphorous
WWII	World War Two

Site ID Conversions

AEDB-R#	OU	GROUP	DESCRIPTION
MSFC-002	OU-18	CERCLA	INACTIVE ABANDONED DRUM DISPOSAL SITE
MSFC-003	OU-18	CERCLA	INACTIVE OLD BONE YARD DISPOSAL SITE
MSFC-027	OU-05	CERCLA	INACTIVE M-1 WASTE ACCUMULATION AREA
MSFC-034	OU-18	CERCLA	INACTIVE MECHANICAL ROOM SUMP, BLDG 4481
MSFC-035	OU-18	CERCLA	INACTIVE SUMP/TILED DRAIN FIELD-EAST TA
MSFC-053	OU-18	CERCLA	FORMER PROPELLANT STORAGE AREA
MSFC-055	OU-18	RC	DISMANTLED STAUFFER CHEM.MFG. PLANT SITE (transferred to NASA)
MSFC-060	OU-18	RC	INACTIVE DELUGE WATER DRAINAGE SYS.
MSFC-065	OU-18	RC	SURFACE DRAINAGE DITCH (transferred to NASA)
MSFC-074	OU-06	RC	INACTIVE DISPOSAL SITE (closed via Admin Letter in March 2006)
MSFC-077	OU-18	CERCLA	INACTIVE OPEN BURNING/DISPOSAL PITS
MSFC-082	OU-18	RC	INACTIVE CHEM.MUNTS.DEMIL/DISP. TRENCHES (combined with MSFC-003)
MSFC-D	OU-18	RC	FUEL OIL STORAGE TANKS CONTAINMENT BERM (transferred to NASA)
RSA-001		RC	FOX ARMY COMMUNITY HOSPITAL INCINERATOR
RSA-002		RCRA-CA	IN-GROUND OIL/WATER SEPARATOR, BLDG.3338
RSA-003		RCRA-CA	IN-GROUND OIL/WATER SEPARATOR, BLDG.3617
RSA-004		RCRA-CA	IN-GROUND OIL/WATER SEPARATOR & WASHRACK
RSA-005		RCRA-CA	INACTIVE WASTE ACCUMULATION AREA
RSA-006		RCRA-CA	PAINT SHOP & SUMPS BLDG 3634 MOTOR POOL
RSA-007		RC	HAZARDOUS WASTE STORAGE AREA, BLDG. 3775
RSA-008		RCRA-CA	INACTIVE SEWAGE TREATMENT PLANT 4
RSA-009		RCRA-CA	INACTIVE SEWAGE TREATMENT PLANT 3
RSA-010		RCRA-CA	CLOSED UNLINED SANITARY LANDFILL
RSA-011	OU-10	CERCLA	INACTIVE SEWAGE TREATMENT PLANT 1
RSA-012		RCRA-CA	ACTIVE OPEN BURN PANS
RSA-013	OU-14	CERCLA	UNLINED INACTIVE OPEN BURN PADS
RSA-014	OU-14	CERCLA	UNLINED INACTIVE BURN TRENCHES
RSA-015		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 1
RSA-016		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 2
RSA-017		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 3
RSA-018		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 4
RSA-019		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 5
RSA-020		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 6
RSA-021		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 7
RSA-022		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 8
RSA-023		RCRA-Op	HAZARDOUS WASTE STORAGE IGLOO, NO. 9
RSA-024		RC	HAZ. WASTE VACANT STORAGE IGLOO, NO. 10

Site ID Conversions

AEDB-R#	OU	GROUP	DESCRIPTION
RSA-025		RC	HAZ. WASTE VACANT STORAGE IGLOO, NO. 11
RSA-026		RC	HAZ. WASTE VACANT STORAGE IGLOO, NO. 12
RSA-027		RC	HAZ. WASTE VACANT STORAGE IGLOO, NO. 13
RSA-028		RCRA-CA	IN-GROUND OIL/WATER SEPARATOR, 5693 AREA
RSA-029		RC	REDSTONE ARSENAL SANITARY SEWER SYSTEM
RSA-030		RCRA-CA	CENTRAL OIL/WATER SEPARATOR
RSA-031		RCRA-CA	CENTRAL OIL/WATER SEPARATOR STORAGE TANK
RSA-032	OU-15	CERCLA	INACTIVE SCRAP METAL STORAGE AREA
RSA-033		RCRA-CA	PLATING ROOM FLOOR DRAINS, BLDG. 5432
RSA-034		RCRA-CA	WASTE AVIATION FUEL TEMP. STORAGE AREA
RSA-035		RCRA-CA	IN-GROUND OIL/WATER SEPARATOR, BLDG.4812
RSA-036		RCRA-CA	IN-GROUND OIL/WATER SEPARATOR, BLDG.4832
RSA-037		RCRA-CA	UNDERGROUND USED OIL STORAGE TANK, #7846
RSA-038		RC	ABOVE GROUND GASOLINE STORAGE TANK, 3240D
RSA-039		RC	UNDERGROUND USED OIL STORAGE TANK, #3338
RSA-040		RC	UNDERGROUND USED OIL STORAGE TANK, #3617
RSA-041		RC	UNDERGROUND USED OIL STORAGE TANK,#3636
RSA-042		RCRA-CA	OW SEPARATOR USED OIL STORAGE TANK #4812
RSA-043		RC	UNDERGROUND USED OIL STORAGE TANK,#5435A
RSA-044		RCRA-CA	UNDERGROUND USED OIL STORAGE TANK,#5435B
RSA-045	OU-02	CERCLA	REMOVED UNDERGROUND STORAGE TANK SITE
RSA-046		ORAP	INACTIVE CHEMICAL MUNITION TEST SITE
RSA-047	OU-03	CERCLA	INACTIVE CHEMICAL TRAINING FACILITY
RSA-048	OU-02	CERCLA	INACTIVE CLOSED SANITARY LANDFILL
RSA-049	OU-05	CERCLA	CAPPED ARSENIC WASTE LAGOONS-WEST
RSA-050		ORAP	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA
RSA-051	OU-17	CERCLA	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA
RSA-052	OU-08	CERCLA	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA
RSA-053	OU-06	CERCLA	INACTIVE SANITARY & INDUSTRIAL LANDFILL
RSA-054	OU-06	CERCLA	INACTIVE SANITARY & INDUSTRIAL LANDFILL
RSA-055	OU-06	RC	INACTIVE SANITARY & INDUSTRIAL LANDFILL (combined with RSA-54)
RSA-056	OU-06	CERCLA	CAPPED ARSENIC WASTE PONDS-SOUTH
RSA-057	OU-06	CERCLA	INACTIVE ARSENIC WASTE LAGOON-EAST

Site ID Conversions

AEDB-R#	OU	GROUP	DESCRIPTION
RSA-058	OU-07	CERCLA	INACTIVE RUBBLE FILL & WASTE PILE
RSA-059	OU-06	CERCLA	INACTIVE CLOSED CONSTRUCTION RUBBLE FILL
RSA-060	OU-06	CERCLA	INACTIVE SANITARY & INDUSTRIAL LANDFILL
RSA-061	OU-08	CERCLA	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA
RSA-062	OU-08	RC	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA (combined with RSA-61)
RSA-063	OU-17	CERCLA	INACTIVE CHEMICAL MUNITION STORAGE AREA
RSA-064	OU-12	CERCLA	INACTIVE MUNITION DEMIL & DISPOSAL AREA
RSA-065	OU-15	CERCLA	FORMER CHEMICAL DRUM STORAGE AREA
RSA-066	OU-15	CERCLA	INACTIVE ASH DISPOSAL SITE & DEMIL AREA
RSA-067	OU-15	CERCLA	FORMER CHEMICAL DRUM STORAGE AREA
RSA-068	OU-15	CERCLA	INACTIVE TOXIC CHEMICAL DISPOSAL AREA
RSA-069	OU-15	CERCLA	FORMER CHEMICAL DRUM STORAGE AREA
RSA-070	OU-15	RC	INACTIVE TOXIC CHEMICAL DISPOSAL AREA (combined with RSA-69)
RSA-071		RCRA-CA	HIGH EXPLOSIVE DROP TEST SITE AREA
RSA-072		RCRA-CA	MORTAR SHELL TEST SITE AREA
RSA-073		RCRA-CA	HIGH EXPLOSIVE IMPACT TEST SITE (WEST)
RSA-074		RCRA-CA	HIGH EXPLOSIVE IMPACT TEST SITE (EAST)
RSA-075		RC	INACTIVE SOLID WASTE INCINERATOR
RSA-076		RC	RDX/HMX FILTRATION UNIT 1, RARE (NORTH)
RSA-077		RC	RDX/HMX FILTRATION UNIT 2, RARE (SOUTH)
RSA-078		RC	RDX/HMX FILTER UNIT 1 SUMP-RARE (NORTH)
RSA-079		RC	RDX/HMX FILTER UNIT 2 SUMP-RARE (SOUTH)
RSA-080		RC	RDX/HMX SUSPENSION TRANSFER PAD/SUMP
RSA-081		RC	RDX/HMX FILT.UNITS CHARCOAL COLUMN DOLLY
RSA-082	OU-11	RC	FORMER SPARGING UNIT SITE, BLDG. 7595 (combined with RSA-C)
RSA-083	OU-10	CERCLA	INACTIVE SPRAY PAINT BOOTH SUMP
RSA-084	OU-10	RC	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-085		RCRA-CA	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-086		RCRA-CA	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-087	OU-10	CERCLA	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-088	OU-10	CERCLA	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-089	OU-10	RC	INACTIVE PROPELLANT WASTES STORAGE PAD (combined with RSA-097)
RSA-090		RC	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-091		RC	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-092		RC	INACTIVE PROPELLANT WASTES STORAGE PAD
RSA-093		RC	RECLAIMED EMPTY DRUM STORAGE AREA
RSA-094	OU-10	CERCLA	CHLORINATED-SOLVENT DISTILLATION UNIT 1
RSA-095	OU-10	CERCLA	CHLORINATED-SOLVENT DISTILLATION UNIT 2

Site ID Conversions

AEDB-R#	OU	GROUP	DESCRIPTION
RSA-096	OU-10	CERCLA	CHLORINATED-SOLVENT DISTILLATION UNIT 3
RSA-097	OU-10	CERCLA	CHLORINATED-SOLVENT DISTILLATION UNIT 4
RSA-098	OU-10	CERCLA	CHLORINATED-SOLVENT DISTILLATION UNIT 5
RSA-099	OU-10	RC	ABANDONED PLATING SHOP TANKS & SUMPS (ROD signed in September 2004)
RSA-100		RC	ABOVE GROUND WASTE OIL TANK, BLDG. 7630
RSA-101		RC	ENCAPSULATED DDT CONTAMINATED SOIL AREA
RSA-102		RC	DISMANTLED DDT MFG. PLANT SITE
RSA-103		RC	CLOSED INACTIVE DDT SETTLING LAGOON
RSA-104	OU-06	RC	INACTIVE ISP WASTEWATER DISCHARGE DITCH (combined with RSA-117)
RSA-105		RC	INACTIVE CLOSED DDT DRAINAGE DITCHES
RSA-106		RC	ACTIVE DDT EARTHEN RETENTION DAMS
RSA-107		RC	CLOSED DDT CONTAM.SOILS/DEBRIS LANDFILL
RSA-108	OU-16	RC	TEST RANGE 4 MISSILE IMPACT SITE
RSA-109	OU-08	CERCLA	FORMER CHEMICAL MUNITIONS STAGING AREA
RSA-110	OU-15	CERCLA	FORMER DRUM STORAGE/CONSTRUCTION DEBRIS
RSA-111		RC	CONSTRUCTION DEBRIS
RSA-112	OU-07	CERCLA	FORMER DEMILITARIZATION & DISPOSAL SITE
RSA-113	OU-07	CERCLA	INACTIVE DISPOSAL TRENCHES & BURN PITS
RSA-114	OU-04	CERCLA	INACTIVE MADKIN MOUNTAIN ROCK QUARRY
RSA-115		ORAP	INACTIVE EAST SIDE BLOWDOWN LAGOON
RSA-116		RCRA-CA	SOUTH SIDE BLOWDOWN LAGOON
RSA-117	OU-06	CERCLA	FORMER LIQUID CAUSTIC MFG. PLANT
RSA-118	OU-06	RC	INACTIVE ISP INDUSTRIAL DISCHARGE LAGOON (combined with RSA-117)
RSA-119		RC	ISP INTERNATIONAL MANUFACTURING PLANT
RSA-120		RC	MATTHEWS CAVE AND RAVINE
RSA-121		RCRA-CA	PAINT SHOP/PAINT WASHOUT BOOTH-BLDG 4762
RSA-122	OU-06	CERCLA	DISMANTLED LEWISITE MFG. PLANTS SITE
RSA-123		RC	INACTIVE CEMENT PLANT SUMP
RSA-124		RC	DISMANTLED CALGON DDT-CONTAMINATED WTP
RSA-125		RCRA-CA	WASTE ACCUMULATION AREA, BLDG. 5477
RSA-126	OU-06	CERCLA	INACTIVE OPEN BURN TRENCH
RSA-127		RCRA-CA	PHOTO LAB WASTEWATER SUMP, BLDG. 5451
RSA-128	OU-07	RC	INACTIVE MUSTARD GAS DEMIL AREA (combined with RSA-112)
RSA-129		ORAP	FORMER BURN PAD & CAPPED WASHOUT PIT
RSA-130	OU-09	RC	INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345
RSA-131		RC	ACTIVE OPEN DETONATION AREA

Site ID Conversions

AEDB-R#	OU	GROUP	DESCRIPTION
RSA-132	OU-14	RC	DISMANTLED & REMOVED POPPING FURNACE (combined with RSA-013)
RSA-133	OU-14	RC	INACTIVE ROCKET WASHOUT RACK & SUMP (combined with RSA-013)
RSA-134	OU-07	CERCLA	INACTIVE DISPOSAL TRENCH & BURN PIT
RSA-135A-G		RC	1.1 PROPELLANT WASTE CAPTIVE SUMPS
RSA-135H	OU-11	CERCLA	INACTIVE SUMP FOR 1.1 PROPELLANT WASTES
RSA-135I-N		RC	1.1 PROPELLANT WASTE CAPTIVE SUMPS
RSA-136A-J		RC	1.1 PROPELLANT WASTE DRUM STORAGE PADS
RSA-137A-P		RC	1.3 PROPELLANT WASTE SUMPS AND CAPTIVE SUMPS
RSA-138A-L		RC	1.3 PROPELLANT WASTE DRUM STORAGE PADS
RSA-138M	OU-10	CERCLA	INACTIVE TEMPORARY STORAGE PAD, BLDG7722
RSA-138N-Q		RC	1.3 PROPELLANT WASTE DRUM STORAGE PADS
RSA-139	OU-06	CERCLA	CAPPED ARSENIC WASTE POND-NORTH
RSA-140	OU-12	CERCLA	INACTIVE DISPOSAL AREA NEAR T/S TOWER
RSA-141	OU-18	CERCLA	4.2 INCH MORTAR DISPOSAL SITE, BLDG 4656
RSA-142	OU-10	CERCLA	CHLORINATED-SOLVENT SPILL
RSA-143	OU-01	CERCLA	UNDERGROUND STORAGE TANK SPILL SITE
RSA-144	OU-11	CERCLA	CHLORINATED-SOLVENT DISTILLATION UNIT 6
RSA-145	GW-01	CERCLA	GROUNDWATER UNIT 01
RSA-146	GW-02	CERCLA	GROUNDWATER UNIT 02
RSA-147	GW-03	CERCLA	GROUNDWATER UNIT 03
RSA-148	GW-04	CERCLA	GROUNDWATER UNIT 04
RSA-149	GW-05	CERCLA	GROUNDWATER UNIT 05
RSA-150	GW-06	CERCLA	GROUNDWATER UNIT 06
RSA-151	GW-07	CERCLA	GROUNDWATER UNIT 07
RSA-152	GW-08	CERCLA	GROUNDWATER UNIT 08
RSA-153	GW-09	CERCLA	GROUNDWATER UNIT 09
RSA-154	GW-10	CERCLA	GROUNDWATER UNIT 10
RSA-155	GW-11	CERCLA	GROUNDWATER UNIT 11
RSA-156	GW-12	CERCLA	GROUNDWATER UNIT 12
RSA-157	GW-13	CERCLA	GROUNDWATER UNIT 13
RSA-183	OU-05	CERCLA	FORMER LEWISITE PRODUCTION FACILITY
RSA-187	OU-10	CERCLA	NORTHERN THIOKOL MIXING FACILITY
RSA-188	OU-10	CERCLA	NORTHERN BURIAL AREA/BURNING GROUND (#3)
RSA-189	OU-10	CERCLA	MOTOR/OXIDIZER PREP FACILITIES
RSA-190	OU-10	CERCLA	DISPOSAL/DRAINAGE AREA WEST OF ROP
RSA-191	OU-10	CERCLA	ROP LINE 1 SERVICE FACILITIES
RSA-192	OU-10	CERCLA	TETRYL AND IGNITER PROCESSING (ROP LINE 1)
RSA-193	OU-10	CERCLA	THIOKOL IGNITER PREPARATION FACILITY
RSA-194	OU-10	CERCLA	PHYSICAL TEST LABORATORY AND STORAGE FACILITIES
RSA-195	OU-10	CERCLA	THIOKOL PROPELLANT MIX FACILITY #1

Site ID Conversions

AEDB-R#	OU	GROUP	DESCRIPTION
RSA-196	OU-10	CERCLA	TEST STAND AND CLEANING BUILDING
RSA-197	OU-10	CERCLA	ROCKET MOTOR TEST STAND
RSA-198	OU-10	CERCLA	THIOKOL EQUIPMENT/TOOL CLEANING FACILITY
RSA-199	OU-10	CERCLA	THIOKOL PROPELLANT MIX FACILITY #2
RSA-200	OU-10	CERCLA	ROP LINE 5 AREA OPERATIONS FACILITIES
RSA-201	OU-10	CERCLA	THIOKOL RESEARCH LABORATORY
RSA-202	OU-10	CERCLA	GRADED AREA NORTHWEST OF ROP STORAGE IGLOOS
RSA-203	OU-10	CERCLA	IGLOO AREA LOADING DOCK
RSA-204	OU-10	CERCLA	THIOKOL OXIDIZER FACILITY
RSA-205	OU-10	CERCLA	PHOTO LAB AND MOTOR SERVICE FACILITY
RSA-206	OU-10	CERCLA	PROPELLANT MIXING FACILITY #2 AND CASTING FACILITY
RSA-207	OU-11	CERCLA	ROHM & HAAS GORGAS LABORATORY
RSA-208	OU-11	CERCLA	SOUTH PLANT TESTING FACILITIES
RSA-209	OU-11	CERCLA	PROPELLANT CRUSHING/GRINDING AND FUSE PRODUCTION
RSA-210	OU-11	CERCLA	NITROGLYCERINE WASH HOUSE
RSA-211	OU-11	CERCLA	SOUTH PLANT STORAGE MAGAZINES
RSA-212	OU-11	CERCLA	PROPELLANT DRY HOUSES
RSA-213	OU-11	CERCLA	ROP LINE 4 AREA OPERATIONS FACILITIES
RSA-214	OU-11	CERCLA	ROP LINE 6 AREA OPERATIONS FACILITIES
RSA-215	OU-10	CERCLA	RSA-146 HISTORIC SERVICE FACILITIES
RSA-217	OU-12	CERCLA	INERT STORAGE WAREHOUSE FACILITIES
RSA-218	OU-12	CERCLA	DRMO OPEN STORAGE AREA
RSA-219	OU-12	CERCLA	CHEMICAL STORAGE AREA IN SALVAGE YARD
RSA-220	OU-12	CERCLA	CONSTRUCTION MATERIAL STORAGE YARD
RSA-223	OU-06	CERCLA	CENTRAL RAILROAD CLASSIFICATION YARD
RSA-224	OU-06	CERCLA	CONTAINER STORAGE AREA
RSA-225	OU-06	CERCLA	FUSE MODIFICATION LINE 7
RSA-226	OU-06	CERCLA	OPEN STORAGE 54-2
RSA-227	OU-06	CERCLA	INACTIVE WASHRACK
RSA-228	OU-01	CERCLA	SEWAGE TREATMENT PLANT 2
RSA-229	OU-01	UST	FORMER PX SERVICE STATION
RSA-230	OU-01	CERCLA	ABANDONED RUBBLE PILE
RSA-231	OU-01	CERCLA	SMF #1 MIXING & PREP FACILITIES
RSA-232	OU-01	CERCLA	SMF #1 SERVICE STATION
RSA-233	OU-01	CERCLA	SMF #2 MIXING AND PREPARATION FACILITIES
RSA-234	OU-01	CERCLA	WASTE DISPOSAL PIT
RSA-235	OU-02	UST	BULK FUEL STORAGE FACILITY
RSA-236	OU-02	CERCLA	GRENADE PACKING AND ASSEMBLY
RSA-237	OU-11	CERCLA	PROPELLANT CUTTING AND DRYING
RSA-238	OU-06	CERCLA	HVA PLANT #2 MUSTARD LINES 5 & 6
RSA-239	OU-10	CERCLA	LINE #1 BOILER HOUSE

Site ID Conversions

AEDB-R#	OU	GROUP	DESCRIPTION
RSA-249	OU-05	CERCLA	INACTIVE OLD BONE YARD DISPOSAL SITE
RSA-250	OU-06	CERCLA	FORMER STORAGE WAREHOUSE – BUILDING 778
RSA-252	OU-06	CERCLA	INCENDIARY BOMB FACILITY PLANT 2 AREA
RSA-A	OU-11	CERCLA	INACTIVE PROPELLANT STORAGE WELLS
RSA-B	OU-11	RC	ABANDONED ARMY PROPELLANT MFG.BLDG 7598
RSA-C	OU-11	CERCLA	ABANDONED ARMY PROPELLANT MIXER BLDG.
RSA-D	OU-02	CERCLA	PAINT BOOTH & PAINT STORAGE SHED
RSA-E		RCRA-CA	FUEL OIL SPILL AT FUEL FARM-TANK 5693
RSA-F		RCRA-CA	FENCED OPEN STORAGE/LAYDOWN YARD

NOTES:
RC: Response Complete
RR: Range Rule
ORAP: Operational Range Assessment Program
UST – RCRA, Subtitle I

Site ID Conversions

OPERABLE UNIT	SITE	DESCRIPTIONS
1	RSA-143	UNDERGROUND STORAGE TANK SPILL SITE
	RSA-228	SEWAGE TREATMENT PLANT 2
	RSA-229	FORMER PX SERVICE STATION
	RSA-230	ABANDONED RUBBLE PILE
	RSA-231	SMF #1 MIXING & PREP FACILITIES
	RSA-232	SMF #1 SERVICE STATION
	RSA-233	SMF #2 MIXING AND PREPARATION FACILITIES
	RSA-234	WASTE DISPOSAL PIT
2	RSA-D	PAINT BOOTH & PAINT STORAGE SHED
	RSA-045	REMOVED UNDERGROUND STORAGE TANK SITE
	RSA-048	INACTIVE CLOSED SANITARY LANDFILL
	RSA-235	BULK FUEL STORAGE FACILITY
	RSA-236	GRENADE PACKING AND ASSEMBLY
3	RSA-047	INACTIVE CHEMICAL TRAINING FACILITY
4	RSA-114	INACTIVE MADKIN MOUNTAIN ROCK QUARRY
5	MSFC-027	INACTIVE M-1 WASTE ACCUMULATION AREA
	RSA-049	CAPPED ARSENIC WASTE LAGOONS-WEST
	RSA-183	FORMER LEWISITE PRODUCTION FACILITY
	RSA-249	INACTIVE OLD BONE YARD DISPOSAL SITE
6	RSA-053	INACTIVE SANITARY & INDUSTRIAL LANDFILL
	RSA-054	INACTIVE SANITARY & INDUSTRIAL LANDFILL
	RSA-056	CAPPED ARSENIC WASTE PONDS-SOUTH
	RSA-057	INACTIVE ARSENIC WASTE LAGOON-EAST
	RSA-059	INACTIVE CLOSED CONSTRUCTION RUBBLE FILL
	RSA-060	INACTIVE SANITARY & INDUSTRIAL LANDFILL
	MSFC-074 - RC	INACTIVE DISPOSAL SITE
	RSA-118	INACTIVE ISP INDUSTRIAL DISCHARGE LAGOON
	RSA-122	DISMANTLED LEWISITE MFG. PLANTS SITE
	RSA-126	INACTIVE OPEN BURN TRENCH
	RSA-139	CAPPED ARSENIC WASTE POND-NORTH
	RSA-223	CENTRAL RAILROAD CLASSIFICATION YARD
	RSA-224	CONTAINER STORAGE AREA
	RSA-225	FUSE MODIFICATION LINE 7
	RSA-226	OPEN STORAGE 54-2
	RSA-227	INACTIVE WASHRACK
	RSA-238	HVA PLANT #2 MUSTARD LINES 5 & 6
	RSA-250	FORMER STORAGE WAREHOUSE – BUILDING 778
	RSA-252	INCENDIARY BOMB FACILITY PLANT 2 AREA
7	RSA-058	INACTIVE RUBBLE FILL & WASTE PILE
	RSA-112	FORMER DEMILITARIZATION & DISPOSAL SITE
	RSA-113	INACTIVE DISPOSAL TRENCHES & BURN PITS
	RSA-134	INACTIVE DISPOSAL TRENCH & BURN PIT

Site ID Conversions

OPERABLE UNIT	SITE	DESCRIPTIONS
8	RSA-052	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA
	RSA-061	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA
	RSA-109	FORMER CHEMICAL MUNITIONS STAGING AREA
9	RSA-130-RC	INACTIVE PHOTOLAB SEPTIC TANK-BLDG.7345 (site RC)
10	RSA-011	INACTIVE SEWAGE TREATMENT PLANT 1
	RSA-083	INACTIVE SPRAY PAINT BOOTH SUMP
	RSA-084- RC	INACTIVE PROPELLANT WASTES STORAGE PAD
	RSA-087	INACTIVE PROPELLANT WASTES STORAGE PAD
	RSA-088	INACTIVE PROPELLANT WASTES STORAGE PAD
	RSA-094	CHLORINATED-SOLVENT DISTILLATION UNIT 1
	RSA-095	CHLORINATED-SOLVENT DISTILLATION UNIT 2
	RSA-096	CHLORINATED-SOLVENT DISTILLATION UNIT 3
10	RSA-097	CHLORINATED-SOLVENT DISTILLATION UNIT 4
	RSA-098	CHLORINATED-SOLVENT DISTILLATION UNIT 5
	RSA-099-RC	ABANDONED PLATING SHOP TANKS & SUMPS
	RSA-138M	INACTIVE TEMPORARY STORAGE PAD, BLDG7722
	RSA-142	CHLORINATED-SOLVENT SPILL
	RSA-187	NORTHERN THIOKOL MIXING FACILITY
	RSA-188	NORTHERN BURIAL AREA/BURNING GROUND (#3)
	RSA-189	MOTOR/OXIDIZER PREP FACILITIES
	RSA-190	DISPOSAL/DRAINAGE AREA WEST OF ROP
	RSA-191	ROP LINE 1 SERVICE FACILITIES
	RSA-192	TETRYL AND IGNITER PROCESSING (ROP LINE 1)
	RSA-193	THIOKOL IGNITER PREPARATION FACILITY
	RSA-194	PHYSICAL TEST LABORATORY AND STORAGE FACILITIES
	RSA-195	THIOKOL PROPELLANT MIX FACILITY #1
	RSA-196	TEST STAND AND CLEANING BUILDING
	RSA-197	ROCKET MOTOR TEST STAND
	RSA-198	THIOKOL EQUIPMENT/TOOL CLEANING FACILITY
	RSA-199	THIOKOL PROPELLANT MIX FACILITY #2
	RSA-200	ROP LINE 5 AREA OPERATIONS FACILITIES
	RSA-201	THIOKOL RESEARCH LABORATORY
	RSA-202	GRADED AREA NORTHWEST OF ROP STORAGE IGLOOS
	RSA-203	IGOO AREA LOADING DOCK
	RSA-204	THIOKOL OXIDIZER FACILITY
	RSA-205	PHOTO LAB AND MOTOR SERVICE FACILITY
	RSA-206	PROPELLANT MIXING FACILITY #2 AND CASTING FACILITY
	RSA-215	RSA-146 HISTORIC SERVICE FACILITIES
	RSA-239	LINE #1 BOILER HOUSE

Site ID Conversions

OPERABLE UNIT	SITE	DESCRIPTIONS
11	RSA-A	INACTIVE PROPELLANT STORAGE WELLS
	RSA-B- RC	ABANDONED ARMY PROPELLANT MFG.BLDG 7598
	RSA-C	ABANDONED ARMY PROPELLANT MIXER BLDG.
	RSA-135H	INACTIVE SUMP FOR 1.1 PROPELLANT WASTES
	RSA-144	CHLORINATED-SOLVENT DISTILLATION UNIT 6
	RSA-207	ROHM & HAAS GORGAS LABORATORY
	RSA-208	SOUTH PLANT TESTING FACILITIES
	RSA-209	PROPELLANT CRUSHING/GRINDING AND FUSE PRODUCTION
	RSA-210	NITROGLYCERINE WASH HOUSE
	RSA-211	SOUTH PLANT STORAGE MAGAZINES
	RSA-212	PROPELLANT DRY HOUSES
	RSA-213	ROP LINE 4 AREA OPERATIONS FACILITIES
	RSA-214	ROP LINE 6 AREA OPERATIONS FACILITIES
	RSA-237	PROPELLANT CUTTING AND DRYING
12	RSA-064	INACTIVE MUNITION DEMIL & DISPOSAL AREA
	RSA-140	INACTIVE DISPOSAL AREA NEAR T/S TOWER
	RSA-217	INERT STORAGE WAREHOUSE FACILITIES
	RSA-218	DRMO OPEN STORAGE AREA
	RSA-219	CHEMICAL STORAGE AREA IN SALVAGE YARD
	RSA-220	CONSTRUCTION MATERIAL STORGE YARD
14	RSA-013	UNLINED INACTIVE OPEN BURN PADS
	RSA-014	UNLINED INACTIVE BURN TRENCHES
15	RSA-032	INACTIVE SCRAP METAL STORAGE AREA
	RSA-065	FORMER CHEMICAL DRUM STORAGE AREA
	RSA-066	INACTIVE ASH DISPOSAL SITE & DEMIL AREA
	RSA-067	FORMER CHEMICAL DRUM STORAGE AREA
	RSA-068	INACTIVE TOXIC CHEMICAL DISPOSAL AREA
	RSA-069	FORMER CHEMICAL DRUM STORAGE AREA
	RSA-110	FORMER DRUM STORAGE/CONSTRUCTION DEBRIS
16	RSA-108-RC	TEST RANGE 4 MISSILE IMPACT SITE
17	RSA-051	INACTIVE MUNITIONS DEMIL & DISPOSAL AREA
	RSA-063	INACTIVE CHEMICAL MUNITION STORAGE AREA
18	MSFC-D-RC	FUEL OIL STORAGE TANKS CONTAINMENT BERM
	MSFC-002	INACTIVE ABANDONED DRUM DISPOSAL SITE
	MSFC-003	INACTIVE OLD BONE YARD DISPOSAL SITE
	MSFC-034	INACTIVE MECHANICAL ROOM SUMP, BLDG 4481
	MSFC-035	INACTIVE SUMP/TILED DRAIN FIELD – EAST TA
	MSFC-053	FORMER PROPELLANT STORAGE AREA
	MSFC-060-RC	INACTIVE DELUGE WATER DRAINAGE SYS.
	MSFC-077	INACTIVE OPEN BURNING/DISPOSAL PITS
	RSA-141	4.2 INCH MORTAR DISPOSAL SITE, BLDG 4656

Site ID Conversions

OPERABLE UNIT	SITE	DESCRIPTIONS
Groundwater	RSA-145	GROUNDWATER SITE 01
	RSA-146	GROUNDWATER SITE 02
	RSA-147	GROUNDWATER SITE 03
	RSA-148	GROUNDWATER SITE 04
	RSA-149	GROUNDWATER SITE 05
	RSA-150	GROUNDWATER SITE 06
	RSA-151 RSA-152	GROUNDWATER SITE 07 GROUNDWATER SITE 08
	RSA-153	GROUNDWATER SITE 09
	RSA-154	GROUNDWATER SITE 10
	RSA-155	GROUNDWATER SITE 11
	RSA-156	GROUNDWATER SITE 12
	RSA-157	GROUNDWATER SITE 13

Installation Information

Installation Locale: Redstone Arsenal (RSA) is a US Army facility located in Madison County, Alabama. RSA occupies approximately 38,300 acres. The Department of Interior owns approximately 4,100 acres of this property and the Tennessee Valley Authority owns 2,900 acres. Another 1,841 acres in the interior of RSA comprise the George C. Marshall Space Flight Center (MSFC) of the National Aeronautics and Space Administration (NASA). RSA is bounded on the north and east by the City of Huntsville, on the west by the City of Madison, on the west and south west by Wheeler National Wildlife Refuge, and on the south by the Tennessee River. Huntsville has a population of nearly 165,000; Madison County population is ~300,000. Approximately 500 military families reside in government quarters on RSA and approximately 26,000 government employees and contractors work at the facility.

Installation Mission: Redstone Arsenal is home to over 60 different tenant organizations. The primary mission of the installation is the development, acquisition, testing, fielding, and sustainment of aviation and missile weapon systems. Most of the installation's tenants support the aviation and missile weapon system effort. However, Redstone is also home to such diverse activities as training for handling explosives and ordnance devices, Defense Intelligence Agency activities, and the production of iron carbonyl.

Lead Organization:
Installation Management Agency, Southeast Regional Office

Lead Executing Agency:
US Army Corps of Engineers

Regulatory Participation:
Federal: US Environmental Protection Agency, Region IV, Atlanta, Georgia
- US Department of Interior, Fish and Wildlife Service, Decatur, Alabama
State: Alabama Department of Environmental Management, Special Projects Office, Montgomery, Alabama, Alabama Partnering Initiative (Risk Managers Partnering Agreement)

National Priorities List (NPL) Status: Redstone Arsenal (US Army/NASA) was placed on the National Priorities List Federal Register on June 30, 1994. The HRS score for Redstone Arsenal was 33.4.

Projected Dates for Construction Completion: 2014
Projected Date for NPL Deletion: 2020

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status: No RAB, TRC or TAPP at Redstone.

Installation Program Summaries

IRP

Primary Contaminants of Concern: Chlorinated Solvents, Pesticides, UXO, CWM, Metals
Affected Media of Concern: Groundwater, Soil, Sediment, Surface Water
Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 2014/2043
Funding to date (up to FY05): $131,194,700
Current year funding (FY06): $12,936,250
Cost-to-Complete (FY07+): $238,390,000

MMRP

Primary Contaminants of Concern: UXO and CWM
Affected Media of Concern: Soil
Estimated Date for RIP/RC: 2017/2032
Funding to date (up to FY05): $0
Current year funding (FY06): $397,000
Cost-to-Complete (2007+): $27,582,000

BRAC

No open AEDB-R sites

Installation Historic Activity

Redstone Arsenal is an active US Army Installation and is currently home to US Army Aviation and Missile Command (AMCOM) and various other tenant organizations. The US Army Garrison – Redstone Arsenal became part of the US Army Installation Management Agency – Southeast Region Office on October 1, 2003. Redstone Army Garrison is responsible for the physical facilities and real property including environmental compliance and installation restoration programs associated with that property.

World War II Operations

The land area of the present RSA includes three separate military facilities originally established in 1941; the Redstone Ordnance Plant (later Redstone Arsenal), the Huntsville Arsenal, and the Gulf Chemical Warfare Depot. These three facilities worked together to produce conventional and chemical munitions for use during World War II from 1942 to 1945. A map of the RSA showing the locations of the three separate WWII facilities is enclosed. The responsibilities for weapon production were separated as follows:

Huntsville Arsenal (HVA)

Huntsville Arsenal covered the largest area and was composed of three production plants (Plant #1, #2, & #3), an airfield and associated bomb and other test ranges, and administrative/support areas. The three plants produced a variety of chemical warfare materials (CWM). Both Plant #1 and Plant #2 produced chemical warfare agents (mustard gas [H] & lewisite [L]), chlorine, phosgene (CG), and white phosphorous (WP). Later tear/vomit gas – Adamsite (CN-DM) was produced in a plant south of the original Plant # 3 boundary and thionyl chloride (TC) in a plant northwest of the Plant # 2 chlorine facility. Plant # 3 produced smoke munitions and gel-type incendiaries. Ultimately, Huntsville Arsenal became the sole manufacturer of colored smoke munitions. During WWII, more than 27 million items of chemical munitions were produced.

To support the development and proof testing of munitions, Huntsville Arsenal included an airfield and test ranges for aerial bombing, mortar and other munitions testing. These areas were located on the northwest and western portion of the current facility. Over 8 million pounds of munitions were dropped or fired at these test range areas.

Since the facilities were designed to be self sufficient, each facility had a power plant and sewage treatment facilities as well as other administrative and support facilities (motor pool, warehouses, etc.).

Redstone Ordnance Plant (ROP)

Munitions (artillery shells, mortars, bombs, etc.) were filled with CWM (chemical warfare material – mustard, lewisite, WP, CG, smoke, gel-type incendiary material, etc.) at one of the three HVA facilities and then transported by railroad to Redstone Ordnance Plant (ROP) for final assembly including installation of any fusing, burster tube, or other explosive configuration. The ROP also produced explosives items, primarily explosive blocks poured from tetryl or composition B. The ROP consisted of six (6) assembly/production lines. Like the HVA, the open style construction enabled rapid change-over from production of one type of munition item to another.

Prior to arrival at the ROP, the munition casing was filled but not explosively configured (weaponized). After final assembly of explosively configured munitions, they were transported to Gulf Chemical Depot for storage in bunkers, igloos, and other structures meeting explosives-safety requirements.

From the depot, they were transported off-site by either railroad or ship from the dock area. There were two railroad classification yards that were used to load and assemble ordnance trains for movement. In January 1943, the ROP underwent a change in name to the Redstone Arsenal (RSA).

Gulf Chemical Depot (GCD)

Gulf Chemical Warfare Depot stored and shipped the munitions as well as bulk chemical and equipment associated with decontamination. Numerous chemical manufacturing plants were operated at the three facilities to produce raw material for toxic agents, as well as to manufacture the agents themselves. The Depot facilities in 1942 included seven warehouses, 370 igloos, 55 above-ground magazines, and outdoor areas for storage of various types of ammunition, bombs, and chemicals. The Toxic Gas Yard received 500,000 pounds of mustard as its initial shipment in early 1942. Shipments of phosgene, carbon tetrachloride, and white phosphorus followed.

The primary receipt and shipment location was the dock area located on the southwest corner of the facility. Immediately after World War II, the Gulf Chemical Depot stopped processing ammunition for shipment, and in turn became a focal point for the return of munitions from shipping ports or overseas. In November 1945, an average of 869 tons were received per day. The Depot demilitarized, decontaminated, and stored surplus chemical munitions and agents, as well as captured German chemical agents.

Post World War II Military Operations

Between 1945 and 1949, all three military units reduced activities to standby status levels. On January 15, 1947, the functions of the Gulf Chemical Depot were incorporated into those of the Huntsville Arsenal, and subsequently the Huntsville Arsenal was declared surplus. On March 31, 1949, the Army planned to sell Huntsville Arsenal and designated the Redstone Arsenal as caretaker of the Huntsville Arsenal properties. Due primarily to the nature of CWM produced at the facility and post WWII demil/decon activities. a decision was made not to sell the facility.

In February 1949, the Research and Development Division, forerunner of the Ordnance Rocket Center, was established at Redstone Arsenal. The Redstone Arsenal was reactivated June 1, 1949 to perform basic research and development (R&D) in rocketry. The Chief of Ordnance designated RSA as the site of the Ordnance Rocket Center and the three separate facilities were combined in 1950 into the present day installation. On October 28, 1949, The Secretary of the Army approved the transfer of the Ordnance Research and Development Division Sub-Office (Rocket) at Fort Bliss, Texas, to RSA.

Cleanup Program Summary

In 1956, the U.S. Army Ballistic Missile Agency (ABMA) was created. The aerospace-related activities of ABMA were transferred to National Aeronautics and Space Administration (NASA) in 1960 and the George C. Marshall Space Flight Center (MSFC) was established in the center of the RSA within the former Huntsville Arsenal Plants Area. Real property, equipment, and personnel were transferred from the RSA to provide the MSFC with resources in 1960 per an Executive Order. The MSFC was instrumental in supporting space exploration, including the Mercury, Gemini, and Apollo Programs of the 1960s and 1970s. Currently, the MSFC commands all Spacelab operations during Space Transport System (STS, e.g., Space Shuttle) missions and tests, and manufactures space vehicles and components.

On August 1, 1962, the U.S. Army Missile Command (MICOM), a major subordinate command of the U.S. Army Materiel Command, was established at Redstone Arsenal. The MICOM was responsible for integrated commodity management of free rockets, guided missiles, ballistic missiles, target missiles, and associated equipment. The MICOM was also responsible for direction and control of assigned installations and activities, basic, and supporting research. On October 1, 1997, the MICOM and the U.S. Army Aviation and Troop Command (ATCOM) were consolidated to form the U.S. Army Aviation and Missile Command (AMCOM) as part of a BRAC 95 decision.

Post World War II Non-Military Operated Activities

The military R&D efforts at Redstone Arsenal have been continually supported from 1949 to present by civilian contractors. The first government contracts were issued in 1949 to the Rohm and Haas Company and the Thiokol Corporation. Both contractors developed, manufactured, and tested solid propellant rocket motors, and developed various types of rocket propellants in support of the Army, Navy, Air Force, and NASA. Rohm and Haas performed research and development on rocket and jet propulsion for various military programs. The Raytheon Company later conducted similar R&D activities, rocket motor assembly, and missile production in the buildings previously occupied by Rohm & Haas. Chemical manufacturing facilities were constructed for the government contractors to provide materials for these R&D activities.

During World War II, the area of Redstone Arsenal currently referred to as the Redstone Rocket Engine Complex or RARE, was the original pilot, and later production plant, for TNT shell loading lines. In 1949, a small portion of this complex was made available under a cost type contract to Thiokol Chemical Corporation for the experimental and developmental effort associated with solid propellant for the Army's tactical rocket motor program. The original contract was for Army programs only. However, in an effort to keep overhead costs under control, the Army later allowed Thiokol to contract with other government agencies, i.e. Air Force, Navy and NASA. This was later expanded to commercial and foreign military sales. These later agreements resulted in a contract lease arrangement whereby Thiokol was allowed to contract commercial or foreign sales that resulted in rental payment to the Army.

This rent factor was based on a percentage of facilities used for support of such programs. Thiokol vacated these facilities in December of 1996.

Subsequent to World War II, the chemical manufacturing facilities used to produce bulk chemicals for the war effort were leased by the Army to privately-owned firms for production of commercial chemicals and pesticides. The manufacturing of pesticides, including DDT, began in 1948. The firms involved were the Alabama Chemical Company (manufacturer of DDT), Solvay Process Division of the Allied Chemical and Dye Corporation (intermediate chemical manufacturer), and John Powell and Company, Inc. (chemical blending, processing, formulating, and bagging). In 1954, Olin Mathieson Chemical Corporation acquired these firms and continued to produce pesticides until 1970. From 1970 to 1971, Olin Corporation, the principal DDT manufacturer, manufactured methoxychlor at the plant under a sub-lease. It is reported that the average production of pesticides was approximately 12,500 tons per year.

The manufacturing of DDT and other pesticides resulted in significant amounts of pesticide contamination as waste product. Thousands of pounds of contaminated wastes were buried in landfills throughout RSA. In addition to solid wastes, large quantities of contaminated wastewater were discharged to surface water. In July of 1979, the US Army initiated an extensive DDT Abatement Program. From July 1979 to August 1982, DDT wastes, including highly-contaminated soil and sediment, were excavated from the DDT manufacturing areas, the DDT drainage ditch, lagoon, and former DDT disposal sites.

Approximately 10,500 cubic feet of pesticide-contaminated solid waste was placed in clay-lined disposal cells of the DDT waste soil landfill (RSA-107). The manufacturing plant structures were dismantled and demolished. In 1983, Olin Corporation began DDT cleanup procedures under a US Justice Department Consent Decree. This remedial action was officially completed in 1987. According to the documentation, RSA-101, 102, 103, 105, and 106 were remediated of DDT contamination. A groundwater, surface water, and a fish monitoring program will continue until residual levels of pesticides, and their breakdown products are reduced to acceptable levels.

It should be noted that the basis for the Olin DDT related remedial work was not consistent with current CERCLA RAGS protocols but was focused almost exclusively on human ingestion of fish. The nature and extent contamination assessment did not include other raw or precursor chemical such as chlorobenzene in soil, sediment, surface water or groundwater. No ecological risk assessments were performed.

Other former commercial operations included Stauffer Chemical Corporation, which produced chlorine and caustic chemical products, and currently, International Specialty Products, Inc., (formerly General Aniline and Film Corporation) which operates an iron carbonyl production plant under a lease by the Army.

Redstone Arsenal (US Army/NASA) was named to the final National Priorities List in Federal Register, Vol. 59, No. 103, May 31, 1994. The effective date was June 30, 1994.

The HRS score for Redstone Arsenal was 33.4. The cause for the listing was the confirmed releases to the environment of metals, pesticides, and chlorinated solvents from past activities.

CURRENT ACTIVITY:

Redstone Arsenal is home to over 60 different tenant organizations. The primary mission of the installation is the development, acquisition, testing, fielding, and sustainment of aviation and missile weapon systems. Most of the installation's tenants support the aviation and missile weapon system effort. However, Redstone is also home to such diverse activities as training for handling explosives and ordnance devices, Defense Intelligence Agency activities, and the production of iron carbonyl.

Redstone Arsenal (US Army/NASA) was named to the final National Priorities List in Federal Register, Vol. 59, No. 103, May 31, 1994. The effective date was June 30, 1994. The HRS score for Redstone Arsenal was 33.4. The NPL listing was fence to fence. The Environmental Protection Agency, Region 4 is the lead regulator for NPL activities on Redstone.

Redstone is also operating under a Hazardous Waste Facility Permit issued by the Alabama Department of Environmental Management (ADEM). The permit was originally issued on April 15, 1998 and was modified on September 17, 2003. The ADEM is the lead regulator for activities governed by the permit.

Some of the hazardous waste sites on Redstone are being addressed under CERCLA, for which EPA, Region 4 is the lead regulator. Other hazardous waste sites on Redstone are being addressed under RCRA Corrective Action regulations per the permit requirements, for which ADEM is the lead regulator. Currently, Redstone does not have a Federal Facilities Agreement in place.

The following issues have impacted the scope and schedule for the restoration activities:

1. Lack of FFA and/or clear RCRA/CERCLA integration agreements for Redstone Arsenal.

2. Poor identification of potential source areas during the early years of the restoration activities.

3. The confirmation of significant perchlorate releases on Redstone and subsequent delay in obtaining agreement between DoD and EPA as to how to address these releases.

4. The need to consider the wetland areas all throughout RSA as integrator areas for the receipt of contamination from various sites.

5. The uncertain regulatory status of DDT manufacturing releases on Redstone.

6. The very complex groundwater flow pathways due to karstic conditions and faulting at Redstone.

7. The relationship between the Army and NASA in regard to Army-responsible sites located in the NASA-controlled Marshall Space Flight Center (MSFC).

8. A list of programmatic level issues that continue to hold up site progress: vapor intrusion, eco risk assessment issues (food chain modeling and habitat identification), issues associated with dioxins/furans/PCBs, total soils analysis and reporting in human health risk assessment evaluations, Surface Water/Sediment background dataset resolution, issues involving "waters of the State" and deep groundwater contamination, issues involving possible radiological contamination, MEC and range issues, contaminated groundwater underneath clean soils, and data usability issues.

IRP

- Prior Year Progress: One site, MSFC-074, was closed via an Administrative Letter and subsequent concurrences from the regulatory agencies. The search to identify release areas is winding down. The last of the Potential Source Area documents has been submitted to the agencies. Following agency review of these documents, the set of sites to be addressed can be finalized and a plan of action for them prepared/implemented. In an effort to address the dismal lack of progress with closing out sites, RSA developed a new Business Plan for prioritizing the IRP effort in order to achieve RIP/RC by FY14. This Business Plan was staffed to the regulatory agencies at the Tier I level for concurrence. After receiving concurrence, the plan was briefed to the Tier II managers in June 2006. The Business Plan will be discussed in more detail in the IRP Contamination Assessment section of the IAP.

MMRP

- Prior Year Progress: Preliminary Assessment (PA) completed at all sites. The range inventory maps are in the process of being corrected so that the MMRP sites can be identified correctly.
- Future Plan of Action: A Site Investigation (SI) kickoff meeting was held in April 2006. The RSA SI effort is currently underway. All of the RSA MMRP sites will be addressed under this SI effort.

BRAC

There are no BRAC sites at Redstone Arsenal.

REDSTONE ARSENAL

Installation Restoration Program

IRP Summary

Total AEDB-R IRP Sites / AEDB-R sites with Response Complete: 226/102

Different Site Types:

4 Above Ground Storage Tanks
8 Burn Areas
17 Contaminated Groundwater
8 Disposal Pit/Dry Well
1 Explosive Ordnance Disposal Area
56 Industrial Discharge
1 Maintenance Yard
1 Plating Shop
2 Spill Site Areas
9 Surface Disposal Areas
10 Underground Storage Tanks
1 Washrack
3 Waste Treatment Plants
2 Building Demo/Debris Removal
18 Chemical Disposal
9 Contaminated Sediments
1 Drainage Ditch
2 Incinerators
9 Landfills
7 Oil/Water Separators
4 Sewage Treatment Plants
41 Storage Areas
6 Surface Impoundment/Lagoons
5 Unexploded Munitions/Ordnance
1 Waste Line

Most Widespread Contaminants of Concern: Chlorinated Solvents, Pesticides, UXO, CWM, Metals, Perchlorate

Media of Concern: Groundwater, Soil, Sediment, Surface Water

Completed Removal (REM)/Interim Remedial Action (IRA)/Remedial Action (RA):
REM at 32 Sites (25 fencing, 3 caps, 2 no-dig restrictions, 1 drum removal, 1 septic tank removal)

Total IRP Funding

Prior years (up to FY05):	$ 131,194,700
Current year funding (FY06):	$ 12,936,250
Future Requirements (FY07+):	$ 238,390,000
Total:	$ 382,520,950

Duration of IRP

Year of IRP Inception: 1977
Year of IRP RIP/RC Completion: 2014
Year of IRP Completion including Long-Term Management (LTM): 2043

IRP Contamination Assessment Overview

1. Initiation of Cleanup Program

Beginning in 1970, the US Army Environmental Hygiene Agency conducted a field survey to characterize the domestic and industrial wastes being discharged from RSA, and to determine if water pollution problems were being caused by the waste discharges. The study identified water pollution problems from two sewage treatment plants, and discharges from Olin Corporation DDT manufacturing operations.

In 1977, The US Army Toxic and Hazardous Material Agency (USATHAMA) completed the Installation Assessment which identified possible disposal areas on Redstone Arsenal. Pesticide contamination was confirmed and it was subsequently decided that remedial action was necessary. The DDT cleanup program occurred at RSA between 1983 and 1988.

In September 1989, the EPA conducted an Interim RCRA Facility Assessment (IRFA) at RSA and another at MSFC. This study resulted in the identification of 110 sites at RSA and 77 sites at Marshall Space Flight Center (MSFC), which is operated by NASA. Between 1989 and 1990, the US Army re-evaluated the EPA IRFA and identified additional sites on RSA, including property located on RSA that is owned by the Tennessee Valley Authority and the Wheeler Wildlife Refuge. A total of 286 sites were identified in this follow-on study. In addition, the potential source area investigation has resulted in a number of sites being added to the program for a total of 395 sites.

2. Description of major program concerns

Of the 395 sites, the Army has responsibility of 305 sites, including the 5 Olin Chemical Corporation DDT sites, and NASA is responsible for 90 sites. Of the 305 Army sites, 153 are being managed under the IRP and 147 are being managed under Compliance Cleanup. Of the 153 Army IRP sites, 128 are being actively investigated, 6 are response complete, 13 have been combined with another site that is being actively investigated, and 6 are being reviewed for IRP eligibility.

The IRP sites were originally organized into 20 Operable Units (OUs). The Arsenal was divided into OUs based on watershed locations, critical and sensitive ecological habitats, soil types, and land use. These 20 OUs continue to be used for surface media site purposes. Interpretation of investigative work conducted prior to 2002 was complicated by findings of contaminants in wells on multiple sites which did not appear to be related to site operational activities.

Based on this finding and the basic awareness of the potential for significant interconnection between groundwater at one location and groundwater at other locations in Karst formations an installation wide hydrogeological study was initiated. The “Karst Report”, as it has become known, has documented the highly interconnected nature of groundwater at the facility and the potential for rapid and long distance contaminant transport. It also documented significant connection between groundwater and surface water.

These interconnections provide conduits for contaminant transfer from groundwater to surface media via springs and other artesian structures as well as opportunities for contaminants in surface water to enter groundwater via sink holes, features in losing reaches of streams and other mechanisms.

Based on these findings a decision was made to separate surface media (primarily surface and subsurface soil) from groundwater. Thirteen groundwater sites have been established based on data from the Karst report. This should allow more focused interpretation of surface media contaminants as posing either: a) human or ecological risks from surface soil or sediment exposure pathways, or b) principle threat source material serving to contaminate groundwater locally or at distance.

Redstone anticipates the use of some type of integrator approach to enable comprehensive evaluation of human and ecological risks from multiple contaminants originating at multiple sites – both surface media and groundwater. In this IAP, these integrators are shown as three sites, RSA-184, 185, and 186, although a final determination for handling the integrator issues has not been made. These integrator sites are anticipated to enable RODs from multiple sites to establish common sampling points and common points of compliance.

The Army is currently negotiating a Federal Facilities Agreement (FFA) with the Alabama Department of Environmental Management (ADEM) and the EPA. The Redstone Arsenal hazardous waste management program is operating under a Hazardous Waste Facility Permit for temporary storage of hazardous waste and for the operation of the Open Burn/Open Detonation (OB/OD) area.

Off site migration of chlorinated solvents and perchlorate in groundwater has been confirmed along the eastern boundary of Redstone. This contaminated groundwater surfaces in springs feeding an unnamed tributary that meanders off and on the installation along the eastern boundary as it flows down to the Tennessee River. Both chlorinated solvents and perchlorate have also been detected in nested monitoring wells located along the Tennessee River.

Two pump and treat facilities were installed in the 1990s to address the source areas of the off-site contamination along the eastern boundary. However, the plants treated only the chlorinated solvents, allowing perchlorate-laden effluent to be discharged to the Huntsville Spring Branch. Subsequent investigation indicated that the current configuration of the plants may not be optimal for containing the contaminated groundwater. Therefore, we began a study to determine if these plants could be used as an effective remedy for this area. The initial findings of this study were presented in the RSA-146 Phase I RI Report, August 2005.

Another pump and treat facility designed to treat a chlorinated solvent release was located at an area along the Tennessee River. Like the contaminated groundwater along the eastern boundary, the groundwater in this area near the Tennessee River was also found to be a commingled plume, containing both chlorinated solvents and perchlorate. Like the other pump and treat facilities, no provisions for treating perchlorate had been included in the design. Therefore, the effluent was found to contain high levels of untreated perchlorate.

Because the discharge from this plant was located at the Tennessee River one mile upstream of the Arsenal's drinking water intake, this plant has been shut down until decisions can be made in regard to perchlorate.

Regulatory interest in Redstone Arsenal remains high, with both EPA, Region 4 and ADEM participating in the restoration activities.

There are a number of complicating factors and uncertainties associated with the Redstone Arsenal IRP. They include:
1. The lack of an FFA and/or clear RCRA/CERCLA integration agreements for Redstone Arsenal. The RCRA/CERCLA integration issues are of high importance to the program due to the Hazardous Waste Facility Permit in place at Redstone. The installation is conducting cleanup activities under both the restoration and compliance arenas. Any sites that are included in an FFA will also be listed on the RCRA permit, making a 3-party FFA essential to the success of the restoration program.

2. Poor identification of potential source areas during the early years of the restoration activities. A major effort has been put into identifying the potential source areas on Redstone during FY03 and FY04. All of the draft documents describing the historical search, site visits, and sampling have been submitted to the regulatory agencies.

3. The confirmation of significant perchlorate releases on Redstone and the subsequent delay of agreement between DoD and EPA as to how to address these releases have had a significant adverse schedule impact on the RSA IRP. Many of the sites with the most significant chlorinated solvent releases have also been impacted by perchlorate releases.

4. The need to use an integrator approach due to commingling of releases to groundwater and the subsequent upwelling of the commingled plumes into wetlands and surface water bodies on Redstone. The integrator concept is intended to establish common sampling points and points of compliance for RODs from the multiple sites. The effort to establish and develop the integrator approach was initiated in 2004 and continues to evolve as information is obtained and discussions are held.

5. The uncertain regulatory status of DDT manufacturing releases on Redstone. A consent order was signed by Olin Chemical, EPA, and ADEM in 1983 for DDT contamination in the Huntsville Spring Branch (HSB) and Indian Creek (IC) watersheds. The cleanup levels required by the consent order do not meet current CERCLA expectations for protection of human health and the environment.

The former DDT manufacturing process and subsequent contamination are located on RSA. Although the RSA listing on the NPL is "fence to fence", the Army's role in regard to the DDT manufacturing process contamination has been unclear due to the existence of the consent order. The EPA has indicated that they will be issuing a letter in FY05 to help clarify the roles of the 1983 consent order and the Army's IRP efforts in regard to the releases from the former DDT manufacturing on Redstone.

6. The very complex groundwater flow pathways due to karstic conditions and faulting at Redstone have added to the uncertainty and complexity of the RSA IRP. The unpredictable nature of the groundwater flow pathways has significantly impacted the Army's ability to quickly and efficiently characterize and delineate groundwater contamination. Additionally, data indicate that contamination from off-site sources may also be affecting groundwater and surface water quality on Redstone. Plans are underway to put in a series of perimeter wells to help identify if/where contamination from off-site sources may be entering the installation. However, no plans have yet been made for how the Army and the regulatory community would handle the situation if it is confirmed that contamination from off-site sources is impacting groundwater and surface water on Redstone. Finally, data from the wells along the Tennessee River indicate that contamination from Redstone may be undercutting the river. A series of sampling events at locations south of the Tennessee River is currently underway to address these concerns.

7. The relationship between the Army and NASA in regard to Army-responsible sites located in the NASA-controlled Marshall Space Flight Center (MSFC) has added a complicating factor to the Redstone IRP. The MSFC is located in the heart of RSA. In order to resolve the situation, the Army and NASA are pursuing a buy-out agreement which would allow the Army to provide funds to NASA, who would complete all outstanding restoration activities for sites within MSFC boundaries.

8. As mentioned previously, a list of programmatic level issues continue to hold up site progress. These issues include: vapor intrusion, eco risk assessment issues (food chain modeling and habitat identification), issues associated with dioxins/furans/PCBs, total soils analysis and reporting in human health risk assessment evaluations, Surface Water/Sediment background dataset resolution, issues involving "waters of the State" and deep groundwater contamination, issues involving possible radiological contamination, MEC and range issues, contaminated groundwater underneath clean soils, and data usability issues. A series of installation-wide workplan addenda are being prepared to address some of these issues. Others will be addressed on site-by-site basis, particularly the dioxins/furans/PCBs sampling protocols.

Redstone Arsenal enjoys a very good relationship with the neighboring communities. To date, the public has been supportive of Redstone's IRP efforts. However, very little public interest has been expressed for forming a Restoration Advisory Board (RAB) at RSA. The public is resolicited on a biannual basis to determine if there is a sustained public interest in forming a RAB.

3. Responses to date addressing major IRP concerns

One ROD has been signed for a NFA at RSA-099. Three sites were closed with Decision Documents because they were determined to require no further action at the SI stage; RSA-B, RSA-084, and RSA-108. One site, RSA-130, has been addressed with a removal action and is closed. One site, MSFC-074, was closed with an Administrative Letter in FY2006. The remedy was put in place in 2004 at RSA-143, which is being addressed under UST regulations.

Investigation work is currently underway for the following sites:

RSA-049 – Cap Effectiveness Report
RSA-146 – Phase I RI Report
RSA-146 (OU-10 area) – Containment Study Report for the P&T plants
Central Dye Trace and Seismic Study Report of Findings
Exit Well Pathway Report of Findings
RSA-011 – RI/FS Report
RSA-057 – PP/ROD
RSA-087 – RI Report
RSA-088/094 – RI Report
RSA-095 – RI Report
RSA-096 – RI Report
RSA-097 – RI Report
RSA-098 – RI Report
MSFC-002/087 – RI/FS Report
RSA-122 – RI Report
RSA-183 – RI Report
Background Study for Surface Water and Sediments
RSA-053 – RI Report
RSA-060 – RI Report
Vapor Intrusion Study Workplan
Integrator Operable Unit Workplan
Potential Source Area Reports for RSA-145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, and 157
RSA-058 – RI Report
Perimeter Well Network Report of Findings
Continuous SW Level/GW Monitoring

RSA-048 – PBC	RSA-054 – PBC
RSA-056 – PBC	RSA-057 – PBC
RSA-059 – PBC	RSA-104 – PBC
RSA-113 – PBC	RSA-122 – PBC
RSA-126 – PBC	RSA-134 – PBC
RSA-139 – PBC	RSA-183 – PBC
RSA-223 – PBC	RSA-224 – PBC
RSA-229 – PBC	RSA-232 – PBC
RSA-235 – PBC	RSA-236 – PBC

RSA-D – PBC

The following remedial actions have been completed or are ongoing:
1. The following sites were fenced to address an imminent risk to human health: RSA-049, 052, 053, 054/055, 058, 059, 061/062, 063, 065, 066, 067, 068, 069/070, 110, 112/128, 113, 114, 139, and 141, MSFC-027,

2. The following caps were installed in response to RCRA Notice of Violations (NOV): RSA-049, 056, and 139,

3. Removal actions were completed for the following sites:
RSA-130 – Septic tank and drain lines removed – site closed
RSA-066 – BaOH drums removed from the site, but the site is not closed,

4. The following treatability studies have been completed or are underway:
RSA-010 P&T – TS completed
RSA-013 P&T – Plant not operating due to perchlorate issues, but TS not yet completed
RSA-014 SVE – System no longer operating due to perchlorate issues, but TS not yet completed
RSA-095 and 096 P&T – Plant not operating, TS underway
RSA-142 P&T – Plant not operating, TS underway.

Cleanup Exit Strategy:

In an effort to organize and program the site restoration efforts in a more efficient manner, a grouping strategy for managing the RSA IRP was proposed and adopted in FY2006. That approach is presented here in detail.

Redstone Arsenal (RSA) currently has 126 distinct Installation Restoration Program (IRP) sites, with 24 more proposed IRP sites, requiring a response (investigation and remediation (if necessary)). The Defense Environmental Restoration Program (DERP) has set a number of goals to include attaining Remedy in Place/Response Complete (RIP/RC) status on all IRP sites by FY14. Additionally, DERP has set goals for RIP/RC by FY07 for all high relative risk sites (RSA has 5) and FY11 for all medium relative risk sites (RSA has 57).

Since its inception the IRP at RSA has reprioritized efforts a number of times based upon various priorities. Recently, DERP RIP/RC goals and completion of the potential source area investigations has resulted in the single Tier 1 technical team working disjointed sites in differing areas of the arsenal. This along with accompanying need to resolve a multitude of programmatic issues at the same time has overwhelmed the current resources of all Tier 1 organizations (the contractor, RSA, COE, ADEM, and EPA). It has proven nearly impossible for the Tier 1 team, as the program is currently organized, to focus and complete site closures.

In an effort to improve efficiency, a set of site groupings was established based primarily upon historical processes/functions. The rationale for grouping by historical function is that the contaminants of concern and the release mechanisms/locations will be similar for the sites in a specific group. Many of the sites in a group also happen to be located in the same general geographical location on the Arsenal.

Groupings

Since the PSA effort is nearly complete, the knowledge of historical activities is significant and can now facilitate the grouping of sites into past functions, most of which are located more or less geographic proximity. There are a total of 17 groups.

Huntsville Arsenal (HA) - Lewisite Plant 2 (L2)

RSA-056	RSA-057	RSA-122	RSA-126
RSA-139			

Huntsville Arsenal (HA) - Lewisite Plant 1 (L1)

RSA-049	**RSA-183**		

Southeast Off-Site Plume Possible Contributors (OFFSITE)

RSA-083	RSA-087	RSA-088	RSA-095
RSA-096	RSA-097/089	RSA-142	RSA-144
RSA-192	RSA-195	RSA-198	RSA-200
RSA-204	RSA-206	RSA-209	RSA-215

Groundwater sites (GW) – consists of all the groundwater sites

RSA-145	RSA-146	RSA-147/148/149	RSA-150
RSA-151	RSA-152	RSA-153	RSA-154
RSA-155	RSA-156	RSA-157	

Open Burn Open Detonation Area (OBOD) – sites in the OBOD area

RSA-013	RSA-014		

Disposal Areas (DA) – consisting of old rubble fill or dump sites

RSA-048	RSA-054	RSA-059	RSA-140
RSA-226	RSA-227	RSA-230	RSA-249

DDT Areas (DDT) – sites that have some connection to the former DDT manufacturing process

RSA-053	RSA-058	RSA-060	RSA-117
RSA-252	Integrators		

Demil Areas (DEMIL) – sites where CWM containing ordnance was demilitarized or otherwise disposed

RSA-051	RSA-052	RSA-061	RSA-063
RSA-064	RSA-109	RSA-112	RSA-113
RSA-114	RSA-134		

Gulf Chemical Warfare Depot Area (GCWD) – consisting of sites active during the GCWD activities and up into the 1970s

RSA-032	RSA-065	RSA-066	RSA-067
RSA-068	RSA-069	RSA-110	

Huntsville Arsenal (HA) - Railroad service areas (RR)

RSA-223	RSA-224		

Huntsville Arsenal (HA) - Mustard Plant 2, lines 5-6 (MUST56)

RSA-238	RSA-250		

Plant Area 3, Incendiaries Manufacturing (PA3)

RSA-045	RSA-047	RSA-225	RSA-228
RSA-231	RSA-233	RSA-234	RSA-236
RSA-D			

Marshall Space Flight Center (MSFC) – the Army-responsible sites within MSFC

MSFC-002/087	MSFC-003	MSFC-027	MSFC-034
MSFC-035	MSFC-053	MSFC-077	RSA-141

Thiokol North Plant (NP) – sites located in the former Thiokol North Plant area with low likelihood of contributing to off-site plume

RSA-011	RSA-094	RSA-098	RSA-138M
RSA-187	RSA-188	RSA-189	RSA-190
RSA-191	RSA-193	RSA-194	RSA-196
RSA-197	RSA-199	RSA-201	RSA-202
RSA-203	RSA-205	RSA-239	

Redstone Ordnance Plant Services area (ROP SER) – sites that are located outside the Thiokol North or South Plant areas that provided services to the original ROP activities with low likelihood of contributing to off-site plume

RSA-214	RSA-217	RSA-218	RSA-219
RSA-220			

Thiokol South Plant (SP) – sites located in the former Thiokol South Plant area with low likelihood of contributing to off-site plume

RSA-135H	RSA-207	RSA-208	RSA-210
RSA-211	RSA-212	RSA-213	RSA-237
RSA-A	RSA-C		

Petroleum sites (POL) – sites that have POL issues exclusively

RSA-143	RSA-229	RSA-232	RSA-235

Groundwater

While the grouping of the surface media sites is relatively simple based upon information gained from the PSA efforts, it is more difficult to develop an approach for dealing with the groundwater. The 2002 Implementation Plan and the Draft Site Management Plan both prioritize groundwater sites based on a general north-to-south flow, starting with the northeast corner of the arsenal. However, due to various migration issues, primarily the off-site plume on the southeastern boundary, it is not always possible to address the groundwater sites in the most logical priority. From the exit pathway well investigation, it is known that sources far up-gradient are contributing to contamination at the Tennessee River.

This would suggest that it is imperative to address the groundwater sites from north-to-south in some manner so that an understanding of fate and transport for the up-gradient source areas can be better defined. Also, within groundwater sites themselves, the fate and transport relationships for the various source areas are not well defined and it is suspected that the source areas are contributing to plumes at other source areas within that same groundwater site. This is particularly true for RSA-147/148/149, which the Central Dye Trace Study Report indicated are interconnected. However, other groundwater sites have been determined through the PSA effort not to contain any plumes with potential for long-distance migration. An attempt was made to prioritize the groundwater sites separately throughout the program, tying them to the surface media sites that are sources of the releases.

Recommended Priorities

The Tier I team has agreed that the highest priority should be placed upon the Huntsville Arsenal Lewisite Plants (HAL1 and HAL2) and the southeast off-site plume (OFFSITE) groupings. The groundwater sites (GW) are also a high priority. The remaining priorities were established based on future buildings needs by the Installation. Finally, consideration was given to the sites that are already under a PBC contract in order to accommodate that contract as much as possible.

Summary

This approach will allow documents for a group of sites to be submitted, reviewed, and revised within a relatively concurrent timeframe (for example, within a certain FY), allowing the team (or technical subgroups) to focus on those specific sites. By staying focused, it is hoped that progress can be made in moving sites through the CERCLA process in a more streamlined manner. Structuring the program in this manner will allow for the formation of more than one RSA team to work the various groups of sites. One team might be reviewing RI Report documentation for a group of sites while also developing the RI Workplans for another group of sites. A different set of site groupings could be assigned to another team to work concurrently, depending on the mission needs of the installation and the resources available both to the Army and the Agencies. This structure may also allow for the development of combined RODs (by group or subset of sites within a group), if warranted.

Currently, contract actions are structured in such a manner that will allow this approach to be implemented with minimal adverse ramifications to the program. The RSA Team believes that by focusing the team(s) on smaller “groupings” of the overwhelming number of sites, we can achieve greater efficiencies and implement appropriate remedies within a shorter timeframe.

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- Treatability Study Quarterly Monitoring Report April 2001-June 2001, OU-10, sites RSA-95/96, Groundwater Recovery and Treatment System. Prepared by IT/Shaw Corp, October 2001.

2001 (continued)

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- CD of OU-10 Slide Presentation from October 23, 2001 Public Meeting. Prepared by IT Corp, October 2001.
- CD of the posters for the Redstone Arsenal (OU-10) Public Information Meeting and Open House held October 23, 2001. Prepared by IT Corp, October 2001.
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2002

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- Final Central Redstone Arsenal (OU-5, 6, 7, 18) Dye Trace Study Field Sampling and Analysis Plan and Safety and Health Plan Addendum. Prepared by Shaw, January 2002.
- Redstone Arsenal 2002 Installation Action Plan. Prepared by Engineering & Environment, Inc., February 2002.
- Huntsville DDT Remedial Action Huntsville Spring Branch Indian Creek Long-Term Monitoring Program Annual Report No. 14. Prepared by Olin Corporation, February 2002.
- Treatability Study Quarterly Monitoring Report July 2001-September 2001, OU-10, site RSA-142 Groundwater Recovery and Treatment System. Prepared by IT/Shaw Corp, February 2002.
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- Treatability Study Quarterly Monitoring Report October 2001-December 2001, OU-10, sites RSA-95/96, Groundwater Recovery and Treatment System. Prepared by IT/Shaw Corp, April 2002.
- Treatability Study Quarterly Monitoring Report October 2001-December 2001, OU-10, site RSA-142, Groundwater Recovery and Treatment System. Prepared by IT/Shaw Corp, April 2002.
- Redstone Arsenal Natural Resources Management Plan. Prepared by RASA, May 2002.
- Redstone Arsenal Implementation Plan, FY2002. Prepared by IT/Shaw Corp, June 2002.
- Safety Submission Volumes I & II, site RSA-14. Prepared by Foster Wheeler, August 2002.
- Closed, Transferring and Transferred Range/Site Inventory Report. Prepared by Malcolm Pirnie, September 2002.
- Site-Specific Safety and Health Plan Pre-Corrective Action Sampling Activities, site RSA-143, Underground Storage Tank Spill Site. Prepared by IT/Shaw Corp, September 2002.
- Technical and Business Proposal CERCLA Investigation. Prepared by Shaw, September 2002.

2002 (continued)

- Treatability Study Quarterly Monitoring Report May 2000-December 2000, OU-10, site RSA-146, Treatment Plant #2. Prepared by Shaw, October 2002.
- Final Design Basis Report for site RSA-146 Treatment Plant #2 for the Treatability Study at OU-10. Prepared by Shaw, October 2002.
- Construction Report for the RSA-146 Treatment Plant #2 for the Treatability Study at OU-10. Prepared by IT Corp, October 2002.
- Appendix C Site Safety and Health Plan Amendment. Prepared by Bhate, November 2002.
- Confirmatory Sampling of Solid Waste Management Units. Prepared by Bhate, November 2002.
- Environmental Baseline Study Southern Bypass Route. Prepared by EMR, December 2002.

2003

- Redstone Arsenal Fact Sheet Issue 13. Prepared by Shaw, February 2003.
- Permit Application for Class V Underground Injection Control (UIC) Permit Application for Site RSA-143, OU-1. Prepared by Shaw, March 2003.
- Redstone Arsenal 2003 Installation Action Plan. Prepared by Shaw, March 2003.
- Final Exit Pathway Monitoring Well Installation Work Plan. Prepared by IT Corp, April 2003.
- Final Seismic Surveys of OU-18, OU-5, OU-6, OU-7, OU-14 and Work Plan and Safety and Health Plan Addendum for Seismic Surveys at OU-5, -6, -7, -14, and -18. Prepared by Shaw, April 2003.
- Redstone Arsenal World War II Resource Study. Prepared by New South Associates , April 2003.
- Final Time-Critical Removal Action Close-Out Report Fencing and Trench Marker Installation, Select Sites in OU-4 through 8, 12, 15, and 17. Prepared by Shaw, May 2003.
- Redstone Arsenal Environmental Site Access Control Program. Prepared by US Army Garrison, May 2003.
- Decision Document for site RSA-143, Underground Storage Tank Spill Site. Prepared by DES, May 2003.
- Final Site-wide Karst Hydrogeologic Investigation, Phase I Report of Findings. Prepared by Shaw, June 2003.
- Supporting Backup for DODIG Audit of FY02 Environmental Liabilities of Select Sites. Prepared by Shaw, July 2003.
- Redstone Arsenal Program Review, August 2003.
- Final Site-Specific Health and Safety Plan for site RSA-122 Phase II Remedial Investigation, Dismantled Lewisite Manufacturing Plants Site. Prepared by Shaw, September 2003.
- Final Site-Specific Safety and Health Plan Attachment, Remedial Investigation at site MSFC-2. Prepared by Shaw, September 2003.
- Final Closeout Report Non-Time Critical Removal Action at site RSA-49, Cap Installation Over the Former Arsenic Ponds, OU-5. Prepared by Shaw, September 2003.
- Final Site-Specific Safety and Health Plan Supplemental Remedial Investigation at site RSA-53 and RSA-60, OU-6A. Prepared by Shaw, September 2003.
- Final Issuance of Modification No. 1 AHWMMA Hazardous Waste Storage/SWMU Corrective Action/Subpart X Permit. Prepared by ADEM, September 2003.

2003 (continued)

- Final Supplemental Information Relevant to Fact Sheet 20 for Updating the Administrative Record File for Time-Critical Removal Actions, Non-Time-Critical Removal Actions, and Treatability Studies at RSA. Prepared by Shaw, October 2003.
- Final Site-Specific Safety and Health Plan Attachment for Corrective Action Activities site RSA-143, Underground Storage Tank Spill Site. Prepared by Shaw, October 2003.
- Work-to-Date Summaries for Multiple Sites: April-June 2002, November 2002, and May-June 2003. Prepared by Shaw, October 2003.
- Presentation Posters Redstone Arsenal Public Meeting, 23 October 2003. Prepared by Shaw, October 2003.
- Final Methodology for the Comparison of Site and Background Data. Prepared by Shaw, November 2003.
- Public Health Assessment for RSA and MSFC. Prepared by ATSDR, November 2003.
- Final Site-Specific Safety and Health Plan for the Remedial Investigation at OU-10 Sites. Prepared by Shaw, December 2003.

2004

- Final Treatability Study Technical Work Plan for Groundwater and Soil at OU-10. Prepared by Shaw, January 2004.
- Final Base-wide Spring/Seep Sampling Plan and Health and Safety Plan Addendum. Prepared by Shaw, January 2004.
- Final Site-Specific Safety and Health Plan Supplemental Remedial Investigation at site RSA-10, OU-6A. Prepared by Shaw, January 2004.
- Final Activity Specific Safety and Health Plan, Surface Water and Sediment Background Study. Prepared by Shaw, January 2004.
- FY-05 Cost-to-Complete Estimate (CTC) for RSA. Prepared by Shaw, January 2004.
- Seismic Reflection Profiling Project at OU-5, 6, 7 and 18. Prepared by Shaw, February 2004.
- Site RSA-146 Site-Specific Field Sampling Plan Attachment, Potential Source Area Investigation, Limited Site Assessments. Prepared by Shaw, March 2004.
- Geophysical Survey at the Marshall Space Flight Center, sites SA-12 and SA-13. Prepared by Technos, Inc., March 2004.
- Revision 1, Submittal of Draft Activity-Specific Safety and Health Plan and Activity-Specific Munitions and Explosives and Concern (MEC) and Site-Specific Safety and Health Plan Attachments, Investigation of Potential Source Areas, Limited Site Assessments. Prepared by Shaw, April 2004.
- Redstone Arsenal 2004 Installation Action Plan. Prepared by RSA, April 2004.
- Draft RSA-145 Site-Specific Field Sampling Plan Attachment, Potential Source Area Investigations, Limited Site Assessments. Prepared by Shaw, May 2004.
- Draft RSA-147 Site-Specific Field Sampling Plan Attachment, Potential Source Area Investigations, Limited Site Assessments. Prepared by Shaw, May 2004.
- Final Supplemental Remedial Investigation Report RSA-99, Abandoned Plating Shop Tanks and Sump, OU-10. Prepared by Shaw, July 2004.
- Community Relations Plan. Prepared by Shaw, July 2004.
- Final Base-wide Spring/Seep Sampling Report of Findings. Prepared by Shaw, July 2004.

2004 (continued)

- Final Site-Specific Field Sampling Plan Attachment, Supplemental Remedial Investigation at site RSA-10, OU-6A. Prepared by Shaw, July 2004.
- Final Site-Specific Field Sampling Plan Surface Water and Sediment Background Study. Prepared by Shaw, July 2004.
- Final Site-Specific Field Sampling Plan Pre-Corrective Action Sampling Activities, site RSA-143, UST Spill Site. Prepared by Shaw, July 2004.
- Final Perchlorate Treatability Study Summary Report Prospective Treatment Alternatives for Groundwater, Soil, and Surface/Spring Water. Prepared by Shaw, July 2004.
- Final Continuous Surface Water Monitoring Report 2000-2002. Prepared by Shaw, July 2004.
- NASA Site Management Plan. Prepared by NASA, September 2004.
- Draft Final Technical Memorandum Limited Indoor Air and Soil Gas Sampling Investigation at MSFC. Prepared by CH2M Hill, September 2004.
- Final Record of Decision site RSA-99, Abandoned Plating Shop Tanks and Sump, Building 7614, OU-10. Prepared by Shaw, September 2004.
- Site RSA-143 Free Product Recovery Report (September 2004). Prepared by DPW-EM-IR, September 2004.
- Draft FFA for RSA. Prepared by RSA. October 2004.
- Draft RI ROF for RSA-096, Solvent Degreaser Distiller at Bldg 7740. Prepared by Shaw. October 2004.
- Draft RI Report for RSA-098, Solvent Degreaser Distiller at Bldg 7346, OU-10, November 2004.
- Resubmittal of the Draft FFA for RSA. Prepared by RSA. November 2004.
- Draft Installation Wide Background Study Report for Sediment and Surface Water. Prepared by Shaw. November 2004.
- Contaminants in the Subsurface: Source Zone Assessment and Remediation. Prepared by National Research Council, November 2004.
- Final site RSA-114 Safety Submission. Prepared by Tetra Tech, November 2004.
- Draft RSA-151, 152, 156, and 157 Site-Specific Field Sampling Plan Attachment, Potential Source Area Investigations, Limited Site Assessments. Prepared by Shaw. December 2004.
- Draft Corrective Action Effectiveness Monitoring Report for RSA-143, OU-1. Prepared by Shaw. December 2004.
- Draft RSA-150, 153, 154, and 155 Site-Specific Field Sampling Plan Attachment, Potential Source Area Investigation, Limited Site Assessments. Prepared by Shaw. December 2004.
- Draft Phase II Remedial Investigation/Feasibility Study RSA-057, Inactive Arsenic Waste Lagoons, East, OU-6B. Prepared by Shaw. December 2004.

2005

- SWMU Assessment Report RSA-223, RSA-224, RSA-225, RSA-226 and RSA-227. Prepared by Shaw, January 2005.
- Draft RSA-147 Potential Source Area Investigation Report. Prepared by Shaw. January 2005.

2005 (continued)

- Draft Revision 1 RI Report for RSA-011, OU-10, Former Sewage Treatment Plant #1. Prepared by Shaw. February 2005.
- Draft RSA-146 Potential Source Area Investigation Report. Prepared by Shaw. January 2005.
- Second Resubmittal of the Draft FFA for RSA. Prepared by RSA. February 2005.
- Draft Cap Effectiveness Report for RSA-049. Prepared by Shaw. March 2005.
- Final Site-Specific Safety and Health Plan Attachment for RSA-143, OU-1 Free Product Delineation. Prepared by Shaw. May 2005.
- Long Term Groundwater Monitoring Trend Analysis Report for RSA-010, OU-6A. Prepared by Shaw. May 2005.
- SWMU Assessment Report RSA-228, RSA-229, RSA-230, RSA-231, RSA-232, RSA-233, RSA-235, and RSA-236. Prepared by Shaw. May 2005.
- Draft RSA-145 Potential Source Area Investigation Report. Prepared by Shaw. June 2005.
- Draft RI Report for RSA-183 Former Lewisite Plant 1, Lines 1 and 2, OU-5. Prepared by Shaw. June 2005.
- Draft Exit Pathway Monitoring Well Installation Work Plan Addendum, Prepared by Shaw. June 2005.
- Draft RSA-146 Phase I RI Report. Prepared by Shaw. July 2005.
- Public Health Assessment for RSA and MSFC. Prepared by ATSDR. July 2005.
- SWMU Assessment Report for RSA-249, 250, and 251. Prepared by Shaw. August 2005.
- Draft RSA-148/149 Potential Source Area Investigation Report. Prepared by Shaw. August 2005.
- Draft-Final Phase II Remedial Investigation/Feasibility Study Report for RSA-057, Inactive Arsenic Waste Lagoons, East, OU-6B. Prepared by Shaw. September 2005.
- Draft RSA-145 Site-Specific Field Sampling Plan Attachment, Potential Source Area Investigation, Limited Site Assessments Addendum: Supplemental Assessments. Prepared by Shaw. September 2005.
- Final MSFC-074 Secondary Site Investigation Report, OU-6A, Prepared by Shaw. October 2005.
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- Investigation Derived Waste (IDW) Management Plan. Prepared by Shaw. October 2005.
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- Draft Site-Specific Field Sampling Plan Attachment for Supplemental RI at RSA-097, Solvent Degreaser Distiller at Bldg 7726. Prepared by Shaw. November 2005.
- Draft Phase II RI Report for RSA-122, Dismantled Lewisite Manufacturing Plant Sites, OU-6B. Prepared by Shaw. November 2005.
- Draft Addendum to Site-wide Remedial Investigation/Feasibility Study Work Plan to Address Additional Sampling at OU-3 at MSFC. Prepared by NASA/CH2M Hill. November 2005.
- Report of Limited Environmental Site Assessment Huntsville Southern Bypass, Prepared by MACTEC. December 2005.

2005 (continued)

- Draft Proposed Plan for RSA-057, Inactive Waste Lagoons East, OU-6B. Prepared by Shaw. December 2005.
- Draft RI Report for RSA-087, Temporary Storage Area at Bldg 7368, OU-10, Prepared by Shaw. December 2005.
- Draft RI Report for RSA-094, Solvent Degreaser Distiller at Bldg 7625, OU-10. Prepared by Shaw. December 2005.
- Draft RI Report for RSA-088, Temporary Storage Pad at Bldg 7625, OU-10. Prepared by Shaw. December 2005.

2006

- Draft Site-Specific Field Sampling Plan for RI at RSA-058, Inactive Rubble Fill and Waste Pile. OU-7. Prepared by Shaw. January 2006.
- Draft RI Report for MSFC-002, Drum Disposal Area, and MSFC-087, Inactive Cyanide Lagoon, OU-18. Prepared by Shaw. January 2006.
- Final Community Relations Plan. Prepared by Shaw. March 2006.
- Final Report of Geophysical Survey to Investigate Geologic and Karst Conditions MSFC. Prepared by Technos. April 2006.
- RSA-146 Perimeter Groundwater Monitoring Workplan. Prepared by Shaw. April 2006.
- Draft Record of Decision Surface Media at RSA-057, Inactive Arsenic Waste Lagoons, East OU-6, April 2006.
- Draft RSA-150, 153, 154, and 155 Potential Source Area Investigation Report. Prepared by Shaw. April 2006.
- Final Statement of Basis/Proposed Plan RSA-057, Inactive Arsenic Waste Lagoons-East, OU-6. Prepared by Shaw. May 2006.
- Final Phase II Remedial Investigation/Feasibility Study Report RSA-057, Inactive Arsenic Waste Lagoons, East, OU-6. Prepared by Shaw. May 2006.
- Addendum to the Draft-Final Site-Specific Field Sampling Plan Attachment Phase II Remedial Investigation at RSA-183 Former Lewisite Plant 1 Lines 1 and 2, OU-5. Prepared by Shaw. June 2006.

No Date

- Redstone Arsenal Complex Chronology Part I: The Pre-Missile Era (1941-1949). Prepared by the US Army.
- Redstone Arsenal Complex Chronology Part II: Nerve Center of Army Missilery, 1950-1962, Section A: The RSA Era (1950-55). Prepared by the US Army.
- Redstone Arsenal Complex Chronology Part II: Nerve Center of Army Missilery, 1950-1962, Section B: The ABMA/AOMC Era (1956-1962). Prepared by the US Army.
- Technical Escort Unit Trip Reports. Prepared by Tech Escort.

REDSTONE ARSENAL

Installation Restoration Program
Site Descriptions

MSFC-002
INACTIVE ABANDONED DRUM DISPOSAL SITE

SITE DESCRIPTION

MSFC-2 consists of several waste piles from the 1950s in the 100-year floodplain. It is located on the western edge of MSFC, and extends approximately 1,000 feet onto Redstone Arsenal. The site is approximately 24 acres. Responsibility for MSFC-087, an inactive cyanide lagoon that is located within the boundary of MSFC-2, has been accepted by the Army.

The 1956 aerial photography shows that the gravel borrow areas within the site boundary were active during this time interval and show up as ponds in subsequent photographs. According to the historical record the site was used as a waste disposal area for a short time during the 1960's. Based on test pit data and additional visual site inspection, predominantly construction debris has been disposed of at the site. Limited other materials, such as empty 55-gallon drums, truck tires, and other debris typically associated with deposits due to flooding were observed on the surface. No evidence of industrial disposal has been found. Previously reported debris from the former beryllium machining facility demolition was not observed. Large pieces of construction debris were piled indiscriminately along the length of the site.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-18
GW SITE #: RSA-149
TYPE NAME: Surface Disposal Area
SITE ACRES: 24
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: PAHs, Pesticides
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199510	199909
RI/FS	200109	200802
RD	200801	200806
RA(C)	200806	200904

RC DATE: 200904

The former cyanide pit/lagoon (MSFC-087) is approximately 30 ft x 30 ft square pit 3 ft deep with a 4 inch thick concrete bottom. The bottom of the pit was covered with one foot layer of crushed limestone and lined with a HDPE liner secured to the top banks of the pit. The lagoon was part of the primary water pollution control facilities. MSFC-087 was operational during the period from 1968 until the late 70's / mid 80's.

CLEANUP STRATEGY

The combined MSFC-002/MSFC-087 RI was submitted in Jan 2006.

A removal action is anticipated and is included in the CTC.

MSFC-003
INACTIVE OLD BONE YARD DISPOSAL SITE

SITE DESCRIPTION

MSFC-3 is located southwest of the Historic Redstone Rocket Test Stand, on both sides of Dodd Road and East of Lem Road. MSFC-3 was an inactive disposal site, approximately 55 acres in size. MSFC-3 was used for the disposal and/or treatment of chemical munitions, toxic materials, chemical wastes, and phosphorous-filled munitions. It was formerly knows as the "old bone yard".

Within MSFC-3 lies a 1.5-acre area labeled on earlier maps as the "Permanent Toxic Storage Area" and several burn pits. MSFC-3 has been expanded to the south and southwest to include MSFC-82 where chemical artillery shells were demilitarized and disposed of in trenches. Several rounds have been discovered in fill material from this area.

NASA has active, buried utility lines going through this site. In 2000, fifty two empty chemically configured 4.2" mortar rounds were uncovered during the repair of a water main. Based on historical reviews, construction and misc. debris from the primary site was relocated to the east across Dodd Rd. during construction of water reservoirs for the Saturn test stand. This activity created two non contiguous sites which together represent MSFC-3.

This site is entirely located within the MSFC boundary. Therefore, LUC enforcement by the Army is questionable.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-18
GW SITE #: RSA-149
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 55
RRSE RATING: Medium
OE: Yes
CONTAMINANTS OF CONCERN: Metals, Pesticides, CWM
MEDIA OF CONCERN: Surface and Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	200109
RI/FS	200901	201203

RC DATE: 201203

CLEANUP STRATEGY

Based on PA/SI data, initiate an RI/FS to:
a) identify any hot spots that present surface risk
b) complete subsurface area nature and extent including potential sourcing to groundwater.

Site will be transferred to the MMR (MSFC-003-R-01) program. If a groundwater action is needed it will be costed and addressed after the MMRP addresses the UXO at the site.

MSFC-082 was closed in AEDB-R and will be funded under MSFC-003/003-R-01.

MSFC-027
INACTIVE WASTE ACCUMULATION AREA

SITE DESCRIPTION

New historical information from the archive search indicates that MSFC-27 was a large (~5.5 million gallon) fuel and other hydrocarbon tank farm. Subsequent use included a contractor lay down yard and a former paint spray booth, which was operated by NASA. The site is located near Observatory Road, approximately 24 acres in size. The site is located near the east-central MSFC boundary, and is relatively flat. Portions of the site are wooded, but the majority is gravel or asphalt-paved area within a fence. The site previously included several large above ground fuel storage tanks. Miscellaneous materials were stored in the area including scrap metal of all types, waste oils, solvents, and sludges.

The site boundary includes MSFC and RSA property. MSFC-081 is located within the site boundary. Dye trace studies have indicated rapid transport from this site down-gradient within RSA-148. Chlorinated hydrocarbons have been detected in the groundwater. However, the groundwater contamination is not believed to be from this site.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-5 & 18
GW SITE #: RSA-148
TYPE CODE: DA
TYPE NAME: Surface Disposal Area
SITE ACRES: 24
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals, Pesticides, PCBs
MEDIA OF CONCERN: Surface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199809
RI/FS	200901	201111

RC DATE: 201111

CLEANUP STRATEGY

The RI/FS for soil contamination will be completed. No further soil action is expected. Any related groundwater investigations (and remedies) are currently assumed to be the responsibility of NASA. In the future, this assumption may change as a result of ongoing negotiations aimed at achieving a better coordinated approach to overall site cleanup.

MSFC-034
FORMER CHEMICAL PRODUCTION AREA

SITE DESCRIPTION

MSFC-34 is located on ~54 acres, in the northern part of MSFC. This site includes all plants associated with WWII HAS mustard production and filing facilities, not just the 4481 sump (as previous listed). There are 24 USTs (16 ethanol and 8 fuel oil) associated with the production and filling facilities believed to still be in place at the site. Mustard scrubbing and decon facilities and potential PCBs from transformers are additional areas of concern.

Soil borings indicate subsurface soils and groundwater have been impacted with chemical agents and their degradation products. The exact source of the release is unknown, but may be related to industrial sewer lines or fluid storage tanks.

In 1959, MSFC took control of these buildings. There are 5 NASA sites located within the MSFC-34 site boundary including the industrial sewer system.

The Army may be required to assume the responsibility for these 5 sites including the industrial sewer within the MSFC-034 boundary. This decision is contingent upon the FFA and the Army-NASA MOA negotiations.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-18
GW SITE #: RSA-149
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 54
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, PCBs, SVOC, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199909
RI/FS	200901	201206
RD	201205	201210
RA(C)	201210	201306
RA(O)	201306	201806
LTM	201806	204306

RIP DATE: 201306
RC DATE: 201806

CLEANUP STRATEGY

Additional RI/FS will be completed that includes the installation of horizontal wells and vertical wells for evaluation of potential groundwater sourcing. The RI effort will require real time CWM monitoring. RA activities include excavation of the 24 USTs. It is assumed that these excavations will not require CWM support. It is anticipated that LUCs will be required due to the highly developed nature of the area and the potential presence of CWM. Successful implementation of the LUC will require coordination with NASA.

Five 5-year reviews are planned. One 5-year review and annual monitoring for the first 5 year period are planned as RA(O). The remaining four 5-year reviews were included in the LTM estimate. Additional monitoring will depend on initial data. The CTC does not include costs associated with the 5 NASA sites within the MSFC-034 boundary.

MSFC-035
INACTIVE SUMP/TILED DRAIN FIELD-EAST TA

SITE DESCRIPTION

MSFC-035 is a concrete-lined sump and tile drain field that was believed to have been operation for a few years during World War II. The unit is located at the north end of the MSFC East Test Stand Area, immediately south of Perimeter Road and 350 feet east of the paved scrap storage pad north of MSFC Test Complex 300. The sump is a brick/concrete above ground structure with a steel manhole cover on top. The drain field is a grassy open field about 1 acre in size.

The 1989 follow-on study to the PA/SI (Harmon, 1989) determined that the unit was part of a latrine and shower area that received raw domestic sewage and gray water from the German POW camp during prisoner captivity during World War II. It is likely that domestic waste from this unit leached into the surface drainage system via ground-water infiltration. In 1989, Geraghty & Miller, Inc. summarized the work Harmon performed and formulated the PA/SI for the site.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-18 & 6
GW SITE #: RSA-148
TYPE NAME: Surface Disposal Area
SITE ACRES: 3.2
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals, Pesticides, SVOC, VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199510	199909
RI/FS	200901	201112

RC DATE: 201112

A 1948 document identifies the inspection of the facility in connection with storing of goop drums and installation of facilities, roads, pits for burning goop.

The 2004 VSI revealed that the current area for MSFC-35 is paved with several large pieces of equipment parked in the area.

CLEANUP STRATEGY

This site will be reopened in AEDB-R. Sampling (PSA for RSA-148) is planned and funded in FY05. A NFA DD will need to be completed.

MSFC-053
FORMER PROPELLANT STORAGE AREA

SITE DESCRIPTION

MSFC-53 is located in the undeveloped area in the vicinity of Building 4751 with Tiros Street to the north, Martin Road to the south, Gemini Avenue to the west, and Thor Avenue to the east. MSFC-53 is a former propellant storage and test site that consisted of a series of concrete-lined test stands and cells, and a propellant storage building (Building 4717). The activities at the site included the use of hydrocarbon-based rocket fuels and chlorinated solvents used for cleaning. All of the test facilities were demolished in 1974.

NASA operates a metals plating shop within the MSFC-053 boundary.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-18
GW SITE #: RSA-148
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 12
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN
Metals, SVOC, VOCs
MEDIA OF CONCERN: Surface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199909
RI/FS	200901	201112
RA(C)	201112	201206
RA(O)	201206	201706
LTM	201706	204206

RIP DATE: 201206
RC DATE: 201706

CLEANUP STRATEGY

The PA/SI indicates that a RI/FS, PP, ROD is warranted. Additional sampling will be primarily based on information received from an Archive Search Report. Land use controls are anticipated.

Five 5-year reviews are planned. One 5-year review and the first 5 years of LUC are planned as RA(O). The remaining four 5-year reviews and LUCs are included in the LTM estimate.

The implementation of LUC is dependant on NASA coordination.

MSFC-077
INACTIVE OPEN BURNING/DISPOSAL PITS

SITE DESCRIPTION

MSFC-77 consists of two former debris disposal pits, each 100 feet in diameter. Based on the reported period of operation from 1950 to 1956, this site is not considered an OE hazard area. The site is located north of Martin Road and west of Thor Road. Currently, the unit is not readily discernible, but is estimated to be 3.4 acres. The area has been filled and vegetated with grass and small pine trees. An earthen berm surrounds the general area on two sides.

CLEANUP STRATEGY

Based on PA/SI data, initiate the RI/FS effort using test pits to characterize the area. The groundwater sourcing evaluation is complicated due to the lack of groundwater.

Site will be transferred to the MMR (MSFC-077-R-01) program.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-18
GW SITE #: RSA-149
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 3.4
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198909	199009
SI	199510	200009
RI/FS	200901	201112

RC DATE: 201112

No remedial action is planned for this site, unless test pits indicate otherwise.

RSA-010
CLOSED UNLINED SANITARY LANDFILL

SITE DESCRIPTION

RSA-010 currently consists of 79 acres in which household waste, paper products, and construction debris have been disposed. The sanitary landfill (20 acres) was active in 1973 and was closed in 1991. This site was expanded to the north to include the waste oil pits and a DDT abatement cell. A new construction debris landfill (permitted) is operated on top of part of the RSA-10 landfill.

A groundwater pump and treat system was operated from June 1996 to August 1999 for VOC contamination.

RSA-010 is located in an extreme down-gradient position relative to a number of known up-gradient source areas. Groundwater at RSA-010 is contaminated with VOCs consistent with these known source areas. The delineation of these up-gradient sites and their relative contribution to the plumes observed at RSA-010 is a critical component with regard to remedial decision making at this site.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-148
TYPE CODE: LF
TYPE NAME: Landfill
SITE ACRES: 79
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil, Surface Water, Sediment

Phases	Start	End
PA	198910	199009
SI	199010	199309
RI/FS	199310	200606

RC DATE: 200606

Compliance monitoring is being performed by the Redstone Environmental Compliance Branch.

In 2006, the wells at the site were abandoned.

Site is being RC'd in the Fall Data call and will be closed under RCRA Compliance.

CLEANUP STRATEGY

This site was determined to not be eligible for DERP funding because it remains active under the arsenal's landfill permit, 45-03R. A request was submitted to the regulatory agencies to manage this site under the compliance program but is still under review.

RSA-011
INACTIVE SEWAGE TREATMENT PLANT NO. 1

SITE DESCRIPTION

RSA-11 consists of an inactive sewage and wastewater treatment plant located in the north central section of the former Redstone Arsenal Rocket Engine Facility North Plant. The plant was used (1940s-1990s) for treatment of domestic sewage generated in the eastern portion of Redstone Arsenal, and wash-water from propellant manufacturing operations. Metals, pesticides and perchlorate have been detected in soil.

Supplemental sampling was conducted in the summer of 2004 to address data gaps identified by the regulators.

Draft final RI/FS report completed in Oct 2005.

CLEANUP STRATEGY

LUCs are planned to maintain the industrial site use.

Five 5-year reviews are planned. One 5-year review and the first 5 years of LUC are planned as RA(O). The remaining four 5-year reviews and LUCs are included in the LTM estimate.

The CTC estimate is based on the draft FS.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ST
TYPE NAME:
Sewage Treatment Plant
SITE ACRES: 2.9
RRSE RATING: Medium
OE RAC: No
CONTAMINANTS OF CONCERN:
Metals, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	200009
RI/FS	200009	200709
RD	200606	200801
RA(C)	200801	200803
RA(O)	200803	201303
LTM	201303	203803

RIP DATE: 200803
RC DATE: 201303

RSA-013
UNLINED INACTIVE OPEN BURN PADS

SITE DESCRIPTION

This site is located on TVA property that RSA has a MOA to use and within an operational range. TVA has to approve all plans for this site. RSA-13 is located near the southwest corner of RSA, south of McAlpine Road, and northeast of the Tennessee River. The site consists of an open burn area where chlorinated solvents, solvent-contaminated materials, waste rocket motor propellant, and scrap metal were incinerated on the ground surface. The resulting ash was disposed of at the RSA-14 ash field, and RSA-66. The flashed metal was salvaged.

The site also includes the former RSA-132 popping furnace area and the former RSA-133 rocket motor washout rack and sump area.

A groundwater pump and treat system was operated from 1997-2000 for VOC contamination. High levels of perchlorates have been detected in the groundwater.

UXO is present at the site. (RSA-013-R-01 has been opened but is listed as RC because this site is on an active range.)

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-14
GW SITE #: RSA-151
TYPE CODE: AB
TYPE NAME: Burn Area
SITE ACRES: 49
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, VOCs, Perchlorates, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil, Surface Water, Sediments

Phases	Start	End
PA	198910	199009
SI	199010	199109
RI/FS	200801	201106
RA(C)	201106	201208
RA(O)	201208	201708
LTM	201708	204208

RIP DATE: 201208
RC DATE: 201708

CLEANUP STRATEGY

Additional RI/FS is necessary due to the expanded site boundary that now includes the embayment area and wetlands to the west and the TCE is present in soil as is potential presence of perchlorate contamination (based upon substantial groundwater concentrations). TCE contamination/recontamination may be occurring due to fluctuating groundwater levels.

If a surface media source of perchlorate is discovered, appropriate changes to the planned remedial actions will be required. At this time only LUCs and 5 year reviews are planned and costed.

Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites. (Groundwater will be sampled under RSA-151.)

RSA-014
UNLINED INACTIVE BURN TRENCHES

SITE DESCRIPTION

RSA-14 is located in the southwest corner of RSA, south of McAlpine Road, northeast of the Tennessee River, and within an operational range. This site is located just outside and adjacent to TVA property. Two open trenches, dimensions 150 to 200 feet long and 35 feet wide and about 6 to 12 feet deep, were used to incinerate solid materials contaminated with rocket propellant, waste solvents, and solvent-contaminated materials.

A SVE system was operated from 1999 to 2000 for VOC contamination. Maximum TCE concentrations of 6,250 mg/kg were in the soils beneath the northern trench. The southern trench soil sample indicated the presence of TCE, but in lower concentrations. Evidence exists that chemical munitions were disposed of at this site.

UXO is present at the site. (RSA-014-R-01 has been opened but is listed as RC because this site is on an active range.)

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-14
GW SITE #: RSA-151
TYPE CODE: AB
TYPE NAME: Burn Area
SITE ACRES: 9.8
RRSE RATING: Medium
OE: Yes
CONTAMINANTS OF CONCERN: Metals, VOCs, Perchlorates, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199010	199109
RI/FS	200801	201106
RA(C)	201106	201208
RA(O)	201208	201708
LTM	201708	204208

RIP DATE: 201208
RC DATE: 201708

CLEANUP STRATEGY

Additional RI/FS is planned to include potential perchlorate contamination in soil and the potential presence of CWM. 1,4-Dithiane and oxathiane have been detected in groundwater samples collected from the site. These contaminants have not been addressed in soils to date. Contamination/recontamination may be occurring due to fluctuating groundwater levels.

Land use controls are expected, but planned remedial action requirements could change based on the results of the additional RI/FS. Five 5 year reviews are planned.

Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites. (Groundwater will be sampled under RSA-151.)

RSA-032
INACTIVE SCRAP METAL STORAGE AREA

SITE DESCRIPTION

RSA-32 was used as a temporary storage yard for munition casings and non-explosive component shipments between 1941 and 1943. The site was used as a storage area for zinc bars for the National Defense Stockpile since the early 1970s. The site was used from the 1980s to 1991 as a scrap metal storage area. The site is located southeast of Shields Road and south of Buxton Road.

MSFC-026, a hazardous waste storage area, was used from the 1970s to the early 1980s, and is located within the RSA-32 boundary. Although current analytical data suggests the surface media site at this location contains no zinc source material, the underlying groundwater contains contamination that seems to originate from the MSFC activities (MSFC-26). NASA had received clean closure for MSFC-026. This decision is being reviewed.

Results from the SI indicate VOCs in the groundwater.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-15
GW SITE #: RSA-152
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 36.3
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199709
RI/FS	200801	201012

RC DATE: 201012

CLEANUP STRATEGY

EPA has asked NASA to review MSFC-026 to address the solvent contamination in groundwater.

This site is identified as part of the proposed NASA buy out, which will involve Army forward funding of NASA execution of responses for Army sites on MSFC property. TCE will be investigated under RSA-032 as part of the buy out.

Data insufficient to identify a remedial approach for TCE at this time.

RSA-045
REMOVED UNDERGROUND USED OIL STORAGE TK

SITE DESCRIPTION

This site is located east of Patton Road and north of Martin Road, in the north central parcel of RSA. Historical information indicates the site was used as an Adamsite and tear gas filling plant, therefore, the site should be renamed the "Former Adamsite Plant". The site was subsequently used as SMF Line 3 through the 1950s.

Previous investigations were limited to a UST area on the north side of the site; therefore, additional investigation is required. Investigation of the UST area found that soils were contaminated with DDT and PCBs.

Current investigations are focusing on POL.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-2
GW SITE #: RSA-145
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 38.5
RRSE RATING: Medium
OE RAC: No
CONTAMINANTS OF CONCERN: Metals, POL, Pesticides, PCBs
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199909
RI/FS	201001	201212
RD	201211	201304
RA(C)	201304	201404

RC DATE: 201404

CLEANUP STRATEGY

Additional RI/FS is necessary due to expanded site definition and boundary (now 38 acres). Soil removal (500 cy) from the waste oil tank area, drainage pathways and Adamsite area is expected and is anticipated to be shipped as Non-Hazardous Waste that meets LDR criteria. Planned remedial actions are based on data collected from previous investigations.

RSA-047
FORMER CHEMICAL TRAINING OPERATIONS

SITE DESCRIPTION

RSA-47 occupies an area approximately 19 acres in the north central part of RSA. Live agents, including mustard and nerve agents were used until 1985. Soil was previously tested from potentially contaminated areas within this fenced area and found low levels of both mustard and nerve agents residue. As a result the area was 3X cleared (decontaminated such that no agent vapors were detected) in the mid-1980s by EOD Tech Escort. The area is currently being used as a chemical training area although live agents are no longer used.

A "No Further Action" ROD was submitted to the regulators in September 1999 and is pending approval. Subsequent to the submittal of the ROD, we received an anecdotal report of buried one-ton cylinders within the site boundary. Research has indicated that the empty one-ton cylinders were used as training aids only and require no further investigation.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-3
GW SITE #: RSA-145
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 18.6
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: CWM, VOCs
MEDIA OF CONCERN: Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199410	199609
RI/FS	199610	200709

RC DATE: 200709

CLEANUP STRATEGY

This site will be reopened in AEDB-R. The September 1999 ROD will be revised to include this information (funded) and resubmitted for approval.

RSA-048
INACTIVE CLOSED SANITARY LANDFILL

SITE DESCRIPTION

RSA-48 is located north of the old railroad bed, east of Patton Road, west of McDonald Creek, and north of Martin Road in the northeast portion of RSA. This disposal area is approximately 4.5 acres and fenced. It was active from 1947 through the early 1950s and received construction rubble. Limited previous sampling indicates the presence of industrial waste constituents. The nature and extent of these waste materials is unknown. The disposal area was not capped, but has a thin layer of soil covering the waste piles/trenches.

Low levels of SVOCs, lead and chromium have been confirmed in the soil. Environmental concerns are driven by the potential of contaminant release from the disposal of sanitary waste in the wetland.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

CLEANUP STRATEGY

PBC will address this site to RIP including RA(O) and a 5 year review.

A more comprehensive RI effort is planned based on review of existing data and test pit findings. Primary objectives of the RI are to delineate and characterize source term and evaluate source to groundwater leaching. Any remedial action will be dependant on the findings of the additional RI.

Administration of LUCs and maintenance of cap and fence may be required indefinitely. Four 5-year reviews are planned.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-2
GW SITE #: RSA-145
TYPE CODE: DA
TYPE NAME: Surface Disposal Area
SITE ACRES: 4.5
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, SVOCs
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199010	199509
RI/FS	200509	201012
RD	200509	201104
RA(C)	200509	201204
RA(O)	200509	201704
LTM	201704	204204

RIP DATE: 201204
RC DATE: 201704

RSA-049
CAPPED ARSENIC WASTE LAGOONS-WEST

SITE DESCRIPTION

RSA-49 is located south of Neal Road at the Toftoy Thruway intersection. It is approximately 12.5 acres and consists of three closed and capped unlined industrial waste lagoons formerly used for the disposal of arsenic-contaminated waste generated from lewisite manufacturing operations during the early 1940s.

In 1999, an engineered cap with an impermeable liner was designed and constructed over the lagoon.

CLEANUP STRATEGY

Currently a cap effectiveness evaluation is underway to determine whether waste sludge is in the aquifer and is sourcing to groundwater. In addition, the extent of the cap is being reviewed to ensure that it provides cover over all contaminants of concern. These issues will be documented in the Cap Effectiveness Report.

Land use controls are necessary for the site. Five five-year reviews are planned. One 5-year review, cap and fence maintenance, and LUCs for the first 5 year period are planned as RA(O). The four five-year reviews, cap maintenance and fence maintenance were included in the LTM estimate.

Annual groundwater monitoring is included for the first five-year review period in order to demonstrate the effectiveness of the remedy.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-5
GW SITE #: RSA-148
TYPE CODE: SI
TYPE NAME: Surface Impoundment/ Lagoon
SITE ACRES: 12.5
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, SVOC
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199010	199609
RI/FS	199610	200709
RA(C)	200709	200803
RA(O)	200803	201303
LTM	201303	203803

RIP DATE: 200803
RC DATE: 201303

RSA-051
INACTIVE MUNITIONS DEMIL & DISPOSAL AREA

SITE DESCRIPTION

RSA-51 occupies about ~20 acres near the southwestern boundary of OU-17 and is characterized by a small number of irregularly spaced, circular burn pad-type features. The area also includes a series of disposal trenches. The site is south of Wheeler Lake and the associated wetlands of Indian Creek and west of Centerline Road at the intersection of Test Area 6 and Test Area 1.

The site demilitarized munitions and explosives by open burning, burning in trenches, burial in trenches, detonation in earthen pits, and similar methods in this area. Artillery shells including white phosphorus rounds were reportedly disposed of at this site. Many regularly spaced trench features about 300 feet long extending east from Anderson Road characterize the trench area. The area is within an active missile test range and is used for pasture land and military exercises. The southern portion of the site is characterized by 12 regularly spaced trench features approximately 150 feet long extending east from the existing gravel road.

Traditional UXO is also present at the site. Archive search indicates the potential presence of CWM.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-17
GW SITE #: RSA-150
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 19.9
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals, White Phosphorus
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199309	199609
RI/FS	201101	201312

RC DATE: 201312

CLEANUP STRATEGY

Complete RI/FS. At this time, there is not enough information to plan a remedial action.

RSA-052
INACTIVE MUNITIONS DEMIL & DISPOSAL AREA

SITE DESCRIPTION

RSA-52 is located in the central part of RSA west of the MSFC West Test Area (the Saturn 5 Test Stand) and Dodd Road. The unit is bounded by Wheeler National Wildlife Refuge to the northwest and south. This unit occupies approximately 63 acres and is fenced. This site is within TA-1 active missile test range. It was used in the 1940s and 1950s as a disposal (open burn/open detonation) site for chemical munitions, including mustard components and lewisite agents. Disposal operations were conducted in the trenches and on the land surface. Records show that over 1 million chemical and white phosphorus rounds were disposed of at this site.

Approximately twenty-five trenches were identified based on a geophysical survey. The trench lengths range from 275 to 650 feet long. Ordnance and metal fragments are evident at the surface throughout the site. The site was fenced in 2001.

The site soils are contaminated with high levels of metals. Vials from Chemical Agent Identification Sets (CAIS) and ordnance have been found at this site.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-8
GW SITE #: RSA-149
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 63
RRSE RATING: Medium
OE: Yes
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, CWM
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	198910	199004
SI	199005	199009
RI/FS	200901	201206
RD	201205	201210
RA(C)	201210	201308
RA(O)	201308	201808
LTM	201808	204308

RIP DATE: 201308
RC DATE: 201808

CLEANUP STRATEGY

Additional RI/FS work is needed to delineate the increased site area. The RI work includes characterization of additional trenchings found during previous RI work. A 7.74 acre geotextile and soil cap will be constructed (which will require UXO construction support) and maintained over the trench area. Land Use Controls will be required. The area is within an active range (TA-1). Five 5 year reviews are planned. Current data indicates that there are source materials originating from this site. Therefore, annual groundwater monitoring for the first 5 year period is planned. Subsequent sampling will be based on the first 5 year data set.

RRSE is being reevaluated since sediment on the southern and western boundary of RSA-052 is addressed in the Integrator OU along this segment of Huntsville Spring Branch. It is anticipated that the RRSE will be decreased. As a result of the decreased RRSE, the funding for FY05 was pushed out. This site is on an active range. This site will be addressed under IRP unless significant changes to scope are identified due to MEC.

RSA-053
INACTIVE SANITARY & INDUSTRIAL LANDFILL

SITE DESCRIPTION

RSA-53 is a closed unlined landfill located near the geographical center of RSA, east of RSA-10, north of Huntsville Spring Branch, west of Patton Road, and south of Mills Road. The site is bounded by the Wheeler Wildlife Refuge to the south. The landfill is approximately 41 acres and is comprised of trenches and pits that were used to dispose of industrial and sanitary wastes. It was active from 1963 to 1973 and received household, administrative, sanitary, and industrial wastes. In the northern area of the site are several inactive waste oil pits and a suspected pesticide burial pit. An ~2 feet thick soil layer covers the refuse in most of the trenches. The site fencing was completed in 2001.

Soil and groundwater contamination includes VOCs (primarily chlorobenzene), SVOCs, metals, and residual pesticides. The bulk of the contamination is due to former DDT manufacturing processes. The original RSA-053 southern site boundary was included in the DDT Migration Abatement Program conducted from 1977 to 1982. This area will be covered by the planned Integrator OU as noted in the proposed plan below.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-148
TYPE CODE: LF
TYPE NAME: Landfill
SITE ACRES: 41.4
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, Pesticides, SVOC, VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199010	199309
RI/FS	200501	200905
RD	200904	200909
RA(C)	200909	201007
RA(O)	201007	201507
LTM	201507	204007

RIP DATE: 201007
RC DATE: 201507

Pesticides were excavated from the site and placed in disposal cells at RSA-107. It appears that the southern portions of the trenches may be inundated by groundwater on a seasonal basis.

CLEANUP STRATEGY

The site has been broken down into three different study areas: northern disposal area, trenchs and the remaining area within site boundaries. A partial excavation of trenchs (~ 46,412 CY), cap the remaining trenchs (~ 3.5 acres), cap in the northern disposal area (0.62 acres), in situ oxidation treatment of chlorobenzene in groundwater. The RI report is being drafted (expected early 2007). Land use controls will be implemented. LTM includes fence & cap maintenance. Five 5 year-reviews are planned. The final 4 five-year reviews are included in LTM. Annual groundwater monitoring for the first 5-year period will be conducted. Subsequent monitoring will be based on first period results. Sediment on the southern boundary of RSA-053 will be addressed in the anticipated Integrator OU along this segment of Huntsville Spring Branch. The funding for FY05 was pushed out pending completion of the 5 year review of the DDT Consent Order.

RSA-054
INACTIVE SANITARY & INDUSTRIAL LANDFILL

SITE DESCRIPTION

RSA-54/55 is a single landfill comprising 45 acres in the central portion of RSA. This inactive, closed landfill was used during the 1960s and 1970s for disposal of household, administrative, and industrial waste. Wastes were disposed of in trenches that were later covered with a thin layer of soil. Wastes containing DDT were buried at various locations in the landfill between 1968 and 1973. These wastes were later excavated and moved to the DDT Waste Soils Landfill at RSA-107. The site was fenced in 2001.

Pesticides were detected in the soil and chlorobenzene was detected in the groundwater.

Since RSA-054 and 055 are made up of one landfill, it will be funded under 054. RSA-055 will be considered RC in AEDB-R.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: LF
TYPE NAME: Landfill
SITE ACRES: 44.8
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Pesticides, VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199010	199309
RI/FS	200509	200912
RD	200509	201004
RA(C)	200509	201104
RA(O)	200509	201604
LTM	201604	204104

RIP DATE: 201104
RC DATE: 201604

CLEANUP STRATEGY

A PBC will address this site to include remedy in place followed by 5 years of RA(O) and a 5 year review.

Additional RI/FS work will be completed to delineate surface soil contamination and VOCs source. LUC will be implemented.

The facility desires to use this north area as parking area. Five 5 year reviews are planned. The final four 5 year reviews are included in LTM. Administration of LUCs and maintenance of cap and fence will be required indefinitely.

RSA-056
CAPPED ARSENIC WASTE PONDS-SOUTH

SITE DESCRIPTION

RSA-56 is a 4.5 acre area, located in the east-central part of the arsenal, north of Viper Road, west of Meteorology Road, and east of Calibration Road. It was an open, unlined surface impoundment that received arsenic-contaminated industrial waste sludge and wastewater from Lewisite manufacturing activities in the early 1940s. In the 1960s, the lagoons received demo debris from the Lewisite manufacturing facilities.

Due to a Notice of Violation issued in 1992 from ADEM for high levels of arsenic in a bordering stream, a 6 acre area was capped with compacted clay in 1995. The RFI report was completed in 1996.

High levels of arsenic were found in the soils and sediment. The site was fenced and soil (clay) cap was extended in 2001 to cover the entire contaminated area.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: SI
TYPE NAME:
Surface Impoundment/ Lagoon
SITE ACRES: 4.47
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199010	199309
RI/FS	200509	200912
RD	200509	201004
RA(C)	200509	201104
RA(O)	200509	201604
LTM	201604	204104

RIP DATE: 201104
RC DATE: 201604

CLEANUP STRATEGY

A PBC will address this site to include remedy in place followed by 5 years of RA(O) and a 5 year review.

Administration of LUCs and maintenance of cap and fence will be required indefinitely. Four 5-year reviews are planned.

RSA-057
INACTIVE ARSENIC WASTE LAGOON-EAST

SITE DESCRIPTION

RSA-57 is an 8 acre site, located in the east-central part of the arsenal, west of Patton Road and south of Martin Road and was designed as a surface impoundment, but was also used as a former lewisite production waste disposal area. Lewisite raw materials were disposed of at an acetylene sludge lagoon (currently bermed on three sides) and in a smaller arsenic sludge lagoon to the northwest. Low levels of arsenic and VOCs were detected in the groundwater. Based on site operational history it is believed that the VOCs originate from other areas such as RSA-122.

Arsenic and mercury are the primary contaminants in the soil.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

CLEANUP STRATEGY

PBC will address site to remedy in place followed by 5 years of RA(O) and a 5 year review.

RI/FS report is has been submitted as draft final, pending comment resolution/approval.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: SI
TYPE NAME:
Surface Impoundment/Lagoon
SITE ACRES: 8
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199004
SI	199005	199509
RI/FS	200301	200609
RD	200509	200701
RA(C)	200509	200711
RA(O)	200509	201211
LTM	201211	203711

RIP DATE: 200711
RC DATE: 201211

Administration of LUCs may be required indefinitely. Four 5-year reviews are planned after PBC.

RSA-058
INACTIVE CLOSED RUBBLE FILL & WASTE PILE

SITE DESCRIPTION

RSA-58 is ~ 34 acres and is located east of Patton Road. McDonald Creek and Huntsville Spring Branch border it on the east and south, respectively.

This landfill received incineration ash from demilitarization operations, rubble (e.g., concrete blocks and slabs, tires, 55-gallon drums, 5-gallon cans, metal debris), damaged PCB transformers and building materials from a nearby Olin DDT manufacturing site. The site was fenced in 2001.

Surface water and groundwater from this site drain into the Wheeler Wildlife Refuge. Both Huntsville Spring Branch and McDonald Creek are main drainage channels for the city of Huntsville.

Pesticides, SVOCs, VOCs, metals and explosives were found in the soil and sediments.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-7
GW SITE #: RSA-145
TYPE CODE: LF
TYPE NAME: Landfill
SITE ACRES: 33.5
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, SVOC, VOCs, Pesticides, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199010	199409
RI/FS	200601	200905
RD	200904	200910
RA(C)	200910	201007
RA(O)	201007	201507
LTM	201507	204007

RIP DATE: 201007
RC DATE: 201507

CLEANUP STRATEGY

Additional RI/FS work will be completed to delineate three hot spots and creek sediment contamination and to address increased acreage. The RI is funded in FY05. Soil removal (~16,000cy) with dewatering and chemical stabilization is expected for pesticide hot spots. Sheet piling for erosion control along McDonald Creek and Huntsville Spring Branch. Unable to cap and dewater based on site geology - year round wetlands area and floodplain. An in situ injection (peroxide) in groundwater for chlorobenzene as secondary source material will be performed at RSA-58. Five 5-year reviews are planned and the final four are included in LTM. Annual monitoring is planned for the first 5-year period. Subsequent period monitoring will be based on first period results.

Surface water and sediment on the eastern and southern boundaries of RSA-058 will be addressed in the anticipated Integrator OU along this segment of Huntsville Spring Branch and McDonald Creek. This area is believed to be the top of the Integrator OU boundary.

RSA-059
INACTIVE CLOSED CONSTRUCTION RUBBLE FILL

SITE DESCRIPTION

RSA-59 is located in the central portion of RSA, south of Mills Road, and west of Patton Road. It is bounded on the north, east, and south sides by wetlands. RSA-59 is a closed unlined landfill previously used for disposal of rubble, construction debris (primarily railroad ties), sanitary and industrial waste. It was intermittently active from the late 1940s to the mid-1970s. Originally, the site was a fillborrow area for early construction activities. A thin layer of soil covers the landfilled waste and the site is well vegetated with grasses, small trees, and brush. The site has not been capped and no remediation has occurred.

During recent investigations, the size was determined to be greater than the original 12 acres, but the entire landfill has not been delineated. The site was partially fenced in 2001. The southeastern boundary could not be fenced due to wetland nature of lower area.

Low concentrations of VOCs were detected in groundwater, and a coal disposal area (likely source of PAHs) was discovered.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: LF
TYPE NAME: Landfill
SITE ACRES: 11.8
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
VOCs, PAHs, Metals
MEDIA OF CONCERN:
Surface & Subsurface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199010	199309
RI/FS	200509	201012
RA(C)	200509	201012
RA(O)	200509	201512
LTM	201512	204012

RIP DATE: 201012
RC DATE: 201512

CLEANUP STRATEGY

A PBC will address this site to remedy in place followed by 5 years of RA(O) and a 5 year review.

Additional RI/FS work will be completed to delineate the landfill. Administration of LUCs may be required indefinitely. Four 5-year reviews are planned after PBC.

RSA-060
INACTIVE SANITARY & INDUSTRIAL LANDFILL

SITE DESCRIPTION

RSA-60 is a closed unlined landfill located near the geographic center of RSA, southeast of RSA-53, north of the Huntsville Spring Branch, and south of Mills Road. It is downgradient of the former Olin pesticide manufacturing plant. A large portion of the site is within the Wheeler National Wildlife Refuge. The landfill is approximately 33 acres. This site consists of several covered disposal unlined trenches, running northeast-southwest, which were used for sanitary and industrial waste disposal. Pesticides (off-spec products from the Olin manufacturing facility) were also buried throughout the site.

Soil is contaminated with VOCs (primarily chlorobenzene), SVOCs , metals and pesticides including DDD, DDE and DDT. These same pesticides are also present in sediments.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-148
TYPE CODE: LF
TYPE NAME: Landfill
SITE ACRES: 33
RRSE RATING: High
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Pesticides
MEDIA OF CONCERN:
Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199010	199309
RI/FS	200601	200905
RD	200904	201001
RA(C)	201001	201007
RA(O)	201007	201507
LTM	201507	204007

RIP DATE: 201007
RC DATE: 201507

CLEANUP STRATEGY

Currently the RI report is being drafted. An excavation of approximately 86,044 cy and clearing of 4.44 acres is anticipated. Stabilization of the soil will be required to meet LDR requirements. Current information suggests trenches may be inundated with water, therefore capping will not be effective. Some regrading activity will be beneficial. LUC and five 5-year reviews are planned. The final four 5-year reviews and LUCs are part of the LTM estimate. Annual monitoring for the first 5-year period will be conducted. Subsequent monitoring will be based on first period results.

Sediment on the southern boundary of RSA-060 will be addressed in the anticipated Integrator OU along this segment of Huntsville Spring Branch.

The funding for FY05 was pushed out pending completion of the 5 year review of the DDT Consent Order.

It is the Army's position that the southern wetland area should properly be part of Triana-Olin DDT abatement area - this was within the original HSB (Huntsville Spring Branch) basin that was diverted to new southern channel. There is a large amount of DDT- contaminated sediment deposited as a result of Olin manufacturing processes, that may eventually become an Army responsibility to remediate. Costs for this effort could exceed $60 million.

RSA-061
INACTIVE MUNITIONS DEMIL & DISPOSAL AREA

SITE DESCRIPTION

RSA-61 is an inactive disposal site that was used in the 1940s and 1950s. The site is located in the central portion of RSA, east of Dodd Road, and north of Huntsville Spring Branch. It was used as a demilitarization and disposal site for white phosphorus and chemical munitions. The materials were incinerated in disposal trenches, covered, and the residues remain in place. The trenches were marked with vertical railroad ties and concrete posts and appear devoid of undergrowth. Twenty trenches have been identified through a geophysical survey. Ordnance and metal fragments are evident at the surface throughout the site.

UXO is present at the site.

The site is contaminated with high levels of metals. VOCs, SVOCs and CWM breakdown products are also present.

During the investigation, the size of the site of RSA-061 was increased to 40 acres. It was also determined that RSA-061 and 062 are one disposal area, and will be addressed as RSA-061. This brought the site size to ~65 acres with 24 trenches. (RSA-062 will be listed as RC in AEDB-R.) Area fencing was completed (in 2001) with trench marking as a TCRA.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-8
GW SITE #: RSA-148
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 65.4
RRSE RATING: Medium
OE: Yes
CONTAMINANTS OF CONCERN:
Metals, CWM, Explosives, SVOCs
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	198910	199004
SI	199005	199009
RI/FS	200901	201206
RD	201205	201210
RA(C)	201210	201308
RA(O)	201308	201808
LTM	201808	204308

RIP DATE: 201308
RC DATE: 201808

CLEANUP STRATEGY

Additional RI/FS work will be completed in order to fully outline all of the trenches and burn areas. A 4.84-acre geotextile/soil cap will be constructed over the trenches which will require UXO construction support. LTM for trench marker, fence and cap maintenance are planned. Land use controls will be implemented. Five 5 year reviews are planned. The final four 5 year reviews are included in LTM. Annual monitoring for the first 5 year period will be conducted. Subsequent monitoring will be based on first period results.

This site is within TA-1 active missile test range. This site will be addressed under IRP unless significant changes to scope are identified due to MEC.

RSA-063
INACTIVE CHEMICAL MUNITION STORAGE AREA

SITE DESCRIPTION

RSA-63 is located near southeastern boundary of OU-17, west of Dodd Road, north of Test Area 1 Centerline Road, and south of Huntsville Spring Branch. RSA-63 is a 7-acre, inactive chemical disposal site used to dispose of munitions contaminated with mustard gas and lewisite (1940-50s) and lies within the active firing zone for Test Area 1.

Records indicate two cement coffins filled with chemical ton containers, unfired bomb casings and ordnance were disposed of in two trenches, which are approximately 265 and 340 feet in length. The trenches were covered with 2 to 4 feet of clean backfill. The site was fenced in 2001.

Metals and CWM breakdown products were detected in the soil.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-17
GW SITE #: RSA-149
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 6.9
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199004
SI	199004	199009
RI/FS	200901	201206
RA(C)	201206	201304
RA(O)	201304	201804
LTM	201804	204304

RIP DATE: 201304
RC DATE: 201804

CLEANUP STRATEGY

Additional RI/FS work will be conducted to support groundwater sourcing determination and to complete non-trench area characterization. A LUC will be implemented. LTM including fence maintenance will be implemented. Five 5 year reviews are planned with the final four being included in LTM. Annual monitoring for the first 5 year period will be conducted. Subsequent monitoring will be based on first period results.

RSA-064
INACTIVE MUNITION DEMIL & DISPOSAL AREA

SITE DESCRIPTION

RSA-64 is located in the southeastern part of the facility, north of Buxton and Sheffield Roads, and west of the Preflight Evaluation Lab, Building 7290. The site is an inactive mustard gas disposal area. The site was active in 1955 and 1956 and occupies less than one acre. Approximately 350 mustard gas shells were demilitarized at the site. Currently, this unit is covered with vegetation, including small trees. The area is fenced (2001), posted, and restricted.

Preliminary sampling results indicate metals in the soils. This site may be a source of chlorinated solvent (TCE) that has been found in area groundwater.

CLEANUP STRATEGY

Additional RI/FS work will be necessary to determine groundwater sourcing. Directional drilling will be used during the RI effort. Current data suggests this area could possibly be a source area to groundwater. CWM, real-time monitoring will be required. The area will be deforested and a soil cover constructed to protect groundwater. Land use controls will be implemented. Five 5-year reviews are planned. Annual monitoring will be conducted during the first 5 years. LTM includes fence and cap maintenance and the final four 5-year reviews.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-12
GW SITE #: RSA-146
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 0.3
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199410	199809
RI/FS	200901	201206
RD	201205	201210
RA(C)	201210	201308
RA(O)	201308	201808
LTM	201808	204308

RIP DATE: 201308
RC DATE: 201808

RSA-065
FORMER CHEMICAL DRUM STORAGE AREA

SITE DESCRIPTION

RSA-65 is located in the southern part of the Arsenal south of Buxton Road within the floodplain of the Tennessee River and is located within an operational range. RSA-65 is a 136-acre, fenced area used for above ground drum storage for chemical warfare agents, including lewisite and mustard gas during the 1940s and 1950s. The chemical materials were shipped off-post for disposal, or were demilitarized at other locations at RSA. The site is generally flat with numerous rectangular storage cells, with each cell occupying ~200 square feet. The storage cells create a grid pattern over the site and are clearly visible on aerial photographs. Water has been impounded on the site by beavers resulting in the development of marshy areas.

The site was fenced in 2001.

Low levels of metals were detected in surface water, elevated levels of TCE and carbon Tetrachloride were detected in groundwater during the SI.

In 2004, it was decided that the potential CWM would be addressed as part of this site.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-15
GW SITE #: RSA-152
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 136
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199510	199709
RI/FS	200801	201106

RC DATE: 201106

CLEANUP STRATEGY

Based on PA/SI data, initiate RI/FS to include aerial geophysical survey. Aerial geophysics is required to identify drums and other anomalies that can not be detected via land-based methods due to the wetland nature of the area. Further investigation will focus on determining the source for VOCs in the groundwater and contaminant transport via sediment and surface water. There is insufficient data to support remedy determination.

Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites.

This site will be addressed under IRP.

RSA-066
INACTIVE ASH DISPOSAL SITE & DEMIL AREA

SITE DESCRIPTION

RSA-66 is a closed unlined waste disposal and demolition area located on the southern portion of RSA, south of Buxton Road, and within one-half mile of the Tennessee River. It is approximately 21 acres and is located within an operational range. The landfill portion (2 acres) of the site was active from the 1950s to the late 1970s, and was used as a disposal area for incineration ash, residue, and unsalvageable metal debris (e.g., rocket motor parts, crushed drums) from the open burning operations at the OB/OD grounds (RSA-14). The site was additionally used for demilitarization of chemically filled ordnance. The site was fenced in 2001.

A large amount of UXO is present on site.

SVOCs, VOCs and metals have been found in the groundwater. VOCs, metals, and explosives have been found in the soil.

RSA-066-R-01 was opened, but is listed as RC because it is located on an active range.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-15
GW SITE #: RSA-152
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 21
RRSE RATING: Medium
OE: Yes
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199010	199109
RI/FS	200801	201012
RA(C)	201012	201202
RA(O)	201202	201702
LTM	201702	204202

RIP DATE: 201202
RC DATE: 201702

CLEANUP STRATEGY

Based on PA/SI data, initiate RI/FS to include aerial geophysical survey and remote drilling due to the abundance and density of UXO. Further investigation will focus on contaminant transport via sediment and surface water. Current data is insufficient to indicate any remedy actions other than LUCs at this time.

Land use controls will be implemented. Five 5-year reviews are planned with the final five 5-year reviews being conducted under LTM. Annual, multi-media monitoring will be conducted during the first 5 year review period. Subsequent monitoring will be based on the findings of the first 5 year sampling.

Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites.

RSA-067
FORMER CHEMICAL DRUM STORAGE AREA

SITE DESCRIPTION

RSA-67 is an inactive 68-acre drum storage area used in the 1940s and 1950s for aboveground storage of mustard gas. Originally, the site was separated into storage cells by unlined earthen berms, rail car tracks, and/ or trails. RSA-67 is located in the southern part of RSA in OU-15, adjacent to another chemical agent storage area, RSA-65 and within an operational range. Most of the northern part of this area is wooded. The majority of the unit is inundated with water. The site was fenced in 2001. A phosgene container was discovered at the site.

In 2004, it was decided that the potential CWM would be addressed as part of this site.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-15
GW SITE #: RSA-152
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 68.2
RRSE RATING: Medium
OE: Yes
CONTAMINANTS OF CONCERN: Metals, SVOCs
MEDIA OF CONCERN: Surface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199110	199509
RI/FS	200801	201106

RC DATE: 201106

CLEANUP STRATEGY

Based on PA/SI data, initiate RI/FS to include aerial geophysical survey. Aerial geophysics is required to identify drums and other anomalies that can not be detected via land-based methods due to the wetland nature of the area. Current data indicates that a removal action and or LUCs may not be necessary.

Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites.

This site will be addressed under IRP.

RSA-068
INACTIVE TOXIC CHEMICAL DISPOSAL AREA

SITE DESCRIPTION

RSA-68 is located in OU-15 in the southern portion of the arsenal, less than 1 mile east of the Tennessee River and within an operational range. It is ~12 acres with wetlands to the north and Igloo Pond to the east. RSA-68 was within the Gulf Chemical Warfare Depot during the 1940s and was used as a demilitarization and disposal area for explosives. From the 1950s to 1980, the site was active as a disposal area for toxic waste and laboratory chemicals. The majority of the chemicals were disposed of in two trenches and buried along the eastern and southern boundaries. The site was fenced in 2001.

During a test pit excavation, metal waste and buried ordnance were encountered. A variety of chemicals were dumped in open trenches and treated in open pits. UXO is present at the site. VOCs, metals, pesticides and explosives were found in the soil. VOCs, metals, explosives and CWM were found in the groundwater. VOCs, metals and CWM were found in the surface water and sediment.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-15
GW SITE #: RSA-152
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 11.7
RRSE RATING: Medium
OE: Yes
CONTAMINANTS OF CONCERN: VOCs, Metals, Explosives, Pesticides, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199010	199509
RI/FS	200801	201012
RA(C)	201011	201202
RA(O)	201202	201702
LTM	201702	204202

RIP DATE: 201202
RC DATE: 201702

CLEANUP STRATEGY

Expand RI/FS to include aerial geophysical survey. Aerial geophysics is required to identify drums and other anomalies that can not be detected via land-based methods due to a variety of obstacles (e.g. the wetland nature of the area, surface UXO, tree cover, subsurface nature of disposal). Further investigation will focus on contaminant transport via sediment and surface water. RD/RA decisions will be made based on results of the additional investigation. Land use controls will be implemented.

Five 5-year reviews are planned with the final four 5-year reviews being conducted under LTM. Annual, multi-media monitoring will be conducted during the first 5 year review period. Subsequent monitoring will be based on the findings of the first 5 year sampling.

Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites.

RSA-069
FORMER CHEMICAL DRUM STORAGE AREA

SITE DESCRIPTION

RSA-69 consists of an inactive mustard storage area in the southern portion of the arsenal along the eastern margin of the floodplain of the Tennessee River within an operational range. It was used for the storage of mustard canisters on bare ground during the 1940s and 1950s. The mustard was removed and shipped off-site and/or demilitarized at OU-15. RSA-69 is wooded and the berms for the storage cells are visible. Areas of the site are usually inundated with water. The site was fenced in 2001.

VOCs and CWM breakdown product were found in the groundwater, but the source cannot be conclusively attributed to this site. Mustard breakdown products have been detected in overburden and bedrock groundwater to the south of the site. TCE has been detected in the northeast section of the site at high levels in groundwater.

Currently, there is no distinction between RSA-69 and RSA-70. Therefore, site RSA-070 was listed as RC in AEDB-R, and any additional needed action will be addressed under RSA-069. The storage area now occupies approximately 72 acres.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-15
GW SITE #: RSA-152
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 72
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, CWM
MEDIA OF CONCERN: Surface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199510	199809
RI/FS	200801	201106

RC DATE: 201106

CLEANUP STRATEGY

Based on PA/SI data, initiate RI/FS to include aerial geophysical survey. Aerial geophysics is required to identify drums and other anomalies that can not be detected via land-based methods due to the wetland nature of the area. Further investigation will focus on contaminant transport via sediment and surface water. There is insufficient data to support remedy determination.

Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites.

RSA-083
INACTIVE SPRAY PAINT BOOTH SUMP

SITE DESCRIPTION

This site consists of a sump associated with a former water-curtain paint operation located at Building 7344 in the northwest section of the former Redstone Arsenal Rocket Engine Facility North Plant. Large missile casings were painted at this building. The unit collected excess paint mist emissions from missile spray painting operations. The water-curtain trapped excess paint mist. Water was re-circulated through the sump/ water-curtain during the painting operation. Paint that collected on the surface of the sump was removed and contained in drums. Supernatant was discharged to a septic tank and field drainage system.

CLEANUP STRATEGY

The RI/FS sampling and reports will be completed, followed by sump and soil removal (207 cy, septic tank & drain field).

Current data suggests the site contains principle threat source material for contaminants; therefore, an in-situ treatment is included in the current CTC estimate. One 5-year review is planned. Annual groundwater monitoring will be conducted during this 5 year review period.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 5.86
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals, VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198810	199809
SI	199510	199609
RI/FS	200701	200912
RD	200911	201004
RA(C)	201004	201102
RA(O)	201102	201602

RIP DATE: 201102
RC DATE: 201602

RSA-087
INACTIVE PROPELLANT WASTES STORAGE PAD

SITE DESCRIPTION

RSA-087, 088, 089 were all used for the same purpose. These sites are located in the east central portion of the arsenal at the former Redstone Arsenal Rocket Engine (RARE) Facility North Plant. These units provided temporary waste storage for plant waste generation points either on concrete pads or as designated spaces on asphalt for 1.3 explosive class waste propellants. Prior to RARE North Plant operations, these areas were part of Redstone Ordnance Plant burster and assembly lines. The areas investigated as RSA-87, 88, and 89 represent the waste storage pads associated with specific activities related to the solid rocket manufacturing, testing and research.

RSA-087 is located at Bldg 7368 and consists of two concrete pads (200 sf) which were used to store drummed cuttings from finished perchlorate propellant. New sheds and storage pads were added adjacent to the older pads at a later date. Although the groundwater underneath the pads is contaminated with TCE, this site is not the source area. A former degreaser, located at Bldg 7368 (RSA-95), appears to be the source of the TCE contamination. PP-G roundwater will be addresses under RSA-146.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 0.28
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Perchlorate
MEDIA OF CONCERN:
Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199410	199909
RI/FS	200301	200710
RD	200709	200802
RA(C)	200802	201002
RA(O)	201002	201502

RIP DATE: 201002
RC DATE: 201502

Additional sources of perchlorate has been identified to the north and northwest of RSA-087. It is anticipated these source areas will become RSA-196 and RSA-198 following completion of the PSA effort.

CLEANUP STRATEGY

The draft RI/FS is expected in Dec 2004. Based on the draft FS, dissolved-phase carbon injection is a potential remedy.

TCE contamination is also present in the groundwater at the site originating from RSA-95. Therefore, the remediation must be sequenced for perchlorate followed by a chemical oxidation for TCE.

One 5-year reviews are planned. Final remedial clean up action levels for perchlorate are pending DOD/EPA resolution.

RSA-088
INACTIVE PROPELLANT WASTES STORAGE PAD

SITE DESCRIPTION

RSA-87, 88, 89 were all used for the same purpose. These sites are located in the east central portion of the Arsenal at the former Redstone Arsenal Rocket Engine Facility North Plant. These units provided temporary waste storage for plant waste generation points either on concrete pads or as designated spaces on asphalt for 1.3 explosive class waste propellants. Prior to RARE North Plant operations, these areas were part of Redstone Ordnance Plant burster and assembly lines. The areas investigated as RSA-87, 88, and 89 represent the waste storage pads associated with specific activities related to the solid rocket testing research only.

RSA-88 is located at Building 7625 and consists of a concrete pad (200 sf) which was used to store drummed cuttings from finished perchlorate propellant. A newer shed and pad were added on at a later date. This location rather than the degreaser in Bldg. 7625 (RSA-94) appears to be the source of the TCE and perchlorate plumes in this area. PP-Groundwater will be addresses under RSA-146.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 0.1
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
VOCs, Perchlorate
MEDIA OF CONCERN:
Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199410	199909
RI/FS	200301	200710
RD	200709	200802
RA(C)	200802	201002
RA(O)	201002	201502

RIP DATE: 201002
RC DATE: 201502

CLEANUP STRATEGY

Based on the draft FS, ex-situ bioremediation (solid amendments) is a potential remedy.

TCE contamination is also present in the groundwater at the site originating from RSA-94. Therefore, the remediation must be sequenced for perchlorate followed by a chemical oxidation for TCE.

One 5-year review is planned. Annual monitoring will be required during the 5 year review period. Final remedial clean up action levels for perchlorate are pending DOD/EPA resolution.

RSA-094
CHLORINATED-SOLVENT DISTILLATION UNIT 1

SITE DESCRIPTION

RSA-094, 095, 096, 097 & 098 were solvent degreasing operations including stills used for distillation and recovery of solvent from vapor degreasers in the former Thiokol plants. The degreasing agent most commonly used at these units was TCE. During vapor degreasing for the rocket motors, the solvent fluid was volatized with heating coils, circulated through the motors, condensed with cooling coils, reconditioned through the distillation unit, and re-circulated through the system. Each degreaser unit was set inside a concrete pit and was equipped with a sump pump to recover solvent during operations.

Within RSA-094, the degreasing sump is located in the central portion of Bldg 7625. The vapor degreaser was installed in 1981. It appears that there have been no significant TCE or perchlorate releases from this site. The TCE and perchlorate plumes in this area appear to originate from RSA-088 (storage pad associated with Bldg 7625).

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2.13
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs
MEDIA OF CONCERN: Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199609
RI/FS	200301	200805

RC DATE: 200805

The RI/FS revised draft report for RSA-094 was submitted in Dec 2005.

CLEANUP STRATEGY

PP and ROD will be completed. NFA for this site is anticipated.

RSA-095
CHLORINATED-SOLVENT DISTILLATION UNIT 2

SITE DESCRIPTION

RSA-94, 095, 096, 097, & 098 were solvent degreasing operations including stills used for distillation and recovery of solvent from vapor degreasers in the former Thiokol plants. The degreasing agent most commonly used at these units was TCE. During vapor degreasing for the rocket motors, the solvent fluid was volatized with heating coils, circulated through the motors, condensed with cooling coils, reconditioned through the distillation unit, and re-circulated through the system. Each degreaser unit was set inside a concrete pit and was equipped with a sump pump to recover solvent during operations.

PSA investigation (2004) resulted in the expansion of the RSA-95 site boundary to include Buildings 7369 and 7370. These buildings served as ancillary operations to Building 7368.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 9.9
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs
MEDIA OF CONCERN: Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199609
RI/FS	200501	200802
RD	200801	200806
RA(C)	200806	200906

RC DATE: 200906

CLEANUP STRATEGY

Additional RI/FS investigation will be necessary to characterize the nature and extent of this expanded area. Current results indicate that treatment of subsurface soils will be required for TCE. Residual TCE NAPL is present in the soils. DNAPL secondary source term in the saturated zone will be addressed within groundwater site RSA-146. It should be noted that perchlorate contamination is also present in the groundwater at the site originating principally from RSA-87. Therefore, the remediation must be sequenced to address mixed perchlorate and TCE in the groundwater.

Two 222 cy soil removals (2 @ 20x20x15 ft dp) with off-site treatment are anticipated at this site to address TCE in the soil.

A closure report will be prepared upon completion of the action.

RSA-096
CHLORINATED-SOLVENT DISTILLATION UNIT 3

SITE DESCRIPTION

RSA-094, 095, 096, 097, & 098 were solvent degreasing operations including stills used for distillation and recovery of solvent from vapor degreasers in the former Thiokol plants. The degreasing agent most commonly used at these units was TCE. During vapor degreasing for the rocket motors, the solvent fluid was volatized with heating coils, circulated through the motors, condensed with cooling coils, reconditioned through the distillation unit, and re-circulated through the system. Each degreaser unit was set inside a concrete pit and was equipped with a sump pump to recover solvent during operations.

RSA-096 operations (case preparation) centered around Building 7740. The degreaser sump is located in the northwest corner of the building. Perchlorate contamination is also present in the soil and groundwater at the site. PSA investigation (2004) for the RSA-146 contributes this perchlorate to proposed CERCLA site RSA-197, Thiokol Static Test Stand.

Draft report of findings has been prepared. Part of the additional RI was funded in FY05. Results indicate that treatment of both subsurface soils and groundwater is required for TCE.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.8
RRSE RATING: Medium
OE No
CONTAMINANTS OF CONCERN: VOCs
MEDIA OF CONCERN: Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199609
RI/FS	200401	200802
RD	200801	200806
RA(C)	200806	200906
RA(O)	200906	201406
LTM	201406	203906

RIP DATE: 200906
RC DATE: 201406

CLEANUP STRATEGY

Additional data will be collected to address the vapor intrusion pathway and residual NAPL. LUCs are expected.

It is anticipated that a TI waiver will address the DNAPL secondary source and groundwater plume in the saturated zone. It is anticipated that some combination of shallow soil remediation and/or engineering controls would be required to abate the vapor pathway issues. In order to define the CTC estimate for the site, a shallow SVE system was presumed to be the engineering control to be used to mitigate vapor intrusion.

Five 5-year reviews are planned. Future groundwater monitoring will be performed under RSA-146.

RSA-097
CHLORINATED-SOLVENT DISTILLATION UNIT 4

SITE DESCRIPTION

RSA-94, 095, 096, 097, & 098 were solvent degreasing operations including stills used for distillation and recovery of solvent from vapor degreasers in the former Thiokol plants. The degreasing agent most commonly used at these units was TCE. During vapor degreasing for the rocket motors, the solvent fluid was volatized with heating coils, circulated through the motors, condensed with cooling coils, reconditioned through the distillation unit, and re-circulated through the system. Each degreaser unit was set inside a concrete pit and was equipped with a sump pump to recover solvent during operations.

The degreaser at RSA-097 is located on the northwest wing of former Bldg 7726. NAPL (mainly TCE) was also detected in sub-surface soils at RSA-097. The underlying groundwater also contains perchlorate. RSA-089, a TSA waste pad, consists of an asphalt pad (200sf) which was used to store drummed wastes of propellants and solvents (and is now included with this site). This site now encompasses the entire production area of Building 7726; associated walkways and drains; and PSA site 146-PS-02A-11 identified in the RSA-146 PSA effort. PP--The groundwater will be addressed under RSA-146.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 5.3
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
VOCs, Perchlorate
MEDIA OF CONCERN:
Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199609
RI/FS	200501	200802
RD	200801	200806
RA(C)	200806	200906
RA(O)	200906	201406

RIP DATE: 200906
RC DATE: 201406

CLEANUP STRATEGY

Additional sampling is required to delineate soil contaminate levels overlying groundwater hotspots (funded in FY05). There are two areas of soil contamination; one area has TCE and perchlorate and one area of just perchlorate. Ex situ bio treatment will be use to address the perchlorate and in situ (dissolved phase carbon injection) will be used for the mixed contamination area.

TCE and perchlorate contamination is also present in the groundwater at the site originating from RSA-097. Therefore, the remediation must be sequenced to address mixed perchlorate and TCE. Site characterization for perchlorate and TCE contamination will move forward.

Future groundwater monitoring will be performed under RSA-146. Final remedial clean up action levels for perchlorate are pending DOD/EPA resolution.

RSA-098
CHLORINATED-SOLVENT DISTILLATION UNIT 5

SITE DESCRIPTION

RSA-94, 095, -96, -97, & -98 were solvent degreasing operations including stills used for distillation and recovery of solvent from vapor degreasers in the former Thiokol plants. The degreasing agent most commonly used at these units was TCE. During vapor degreasing for the rocket motors, the solvent fluid was volatized with heating coils, circulated through the motors, condensed with cooling coils, reconditioned through the distillation unit, and re-circulated through the system. Each degreaser unit was set inside a concrete pit and was equipped with a sump pump to recover solvent during operations.

RSA-98 operations (case preparation) centered around Building 7346. The degreaser sump is located in the southern portion of the building.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs
MEDIA OF CONCERN: Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199609
RI/FS	199610	200509

RC DATE: 200509

CLEANUP STRATEGY

Currently, perchlorate issues at this site are being addressed under RSA-196. In the fall, this site will be reopened in the AEDB-R to accurately reflect the actual work being conducted at this site. Phase dates will be the same as that of RSA-196.

RSA-109
FORMER CHEMICAL MUNITIONS STAGING AREA

SITE DESCRIPTION

The site is ~10 acres, and is located off a former railroad spur north of Huntsville Spring Branch, and west of Dodd Road. The area served as a staging area for chemical munitions awaiting demilitarization at surrounding sites. The site was later used for disposal of construction debris and rubble. This site is within TA-1, an active test missile range area, that is within the Wheeler Wildlife Refuge.

Results of data collected thus far indicate SVOCs, Metal, Pesticides and Explosives in soil, and VOCs in groundwater. CWM has not been identified.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-8
GW SITE #: RSA-149
TYPE CODE: DA
TYPE NAME: Surface Disposal Area
SITE ACRES: 10
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals, SVOC, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198811	198909
SI	199510	200009
RI/FS	201001	201212
RA(C)	201212	201402
RA(O)	201402	201902
LTM	201902	204402

RIP DATE: 201402
RC DATE: 201902

CLEANUP STRATEGY

Based on PA/SI results, a RI/FS will be completed to delineate the identified contamination and determine groundwater sourcing. It is believed that groundwater contamination present at the site is a result of up-gradient NASA activities.

Land use controls are anticipated due to soil contamination. Five 5 year reviews are planned with the final four reviews being conducted as part of LTM. Annual surface water monitoring will be conducted during the first 5 year review period. The need for subsequent sampling will be determined based on the findings of the initial sampling period.

This site is within TA-1 active missile test range. Therefore any remedial work for munitions related contaminants will be deferred to range closure per the MMR.

Sediment on the southern boundary of RSA-109 will be addressed in the anticipated Integrator OU along this segment of Huntsville Spring Branch.

RSA-110
FORMER CHEMICAL DRUM STORAGE AREA

SITE DESCRIPTION

RSA-110 is a 24 acre site located in the south eastern portion of OU-15 within the floodplain of the Tennessee River and within an operational range. The site was used as rail car storage. Rail cars full of chemical ordnance were staged in gravel storage areas waiting to be unloaded. This area was used in the 1940s and 50s. Remains of the gravel storage areas are still visible today. The site is primarily dense brush and wetlands. The site was fenced in 2001.

Much of the site is covered with surface UXO.

In 1989, RSA personnel removed most of the building and fire bricks from the site and dismantled several incinerators/ovens used to destroy munitions. The ground surface of the non-wooded portion of the site has a heavy gravel base (up to 1 foot in thickness in places) with scattered areas containing small surface debris. An area of hummocky surface soil covering about 7 acres was identified in the northeastern portion of RSA-110.

Two piles of discarded Dragon rocket motors were found on site. SVOCs and metals were found in the soil. High levels of thiodiglycol and chlorinated solvents (including 1,1,2,2-tetrachloroethane) have been detected in the groundwater.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-15
GW SITE #: RSA-151
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 24
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals, SVOCs, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199506	199809
RI/FS	200801	201106
RA(C)	201106	201208
RA(O)	201208	201708
LTM	201708	204208

RIP DATE: 201208
RC DATE: 201708

CLEANUP STRATEGY

Based on PA/SI data, initiate RI/FS to include aerial and land-based (drum disposal area) geophysical surveys to identify anomalous areas. Land use controls will be implemented. UXO construction support is necessary to support proposed actions. Five 5-year reviews are planned. Annual monitoring will be conducted during the first 5 year review period. Subsequent monitoring will be based on the findings of the first 5 year sampling. LTM includes fence maintenance and the final 5 five-year reviews.

This site will be addressed under IRP unless significant changes to scope are identified due to MEC. Evaluate area for potential integrator operable unit development. Costs for the evaluation and development of the integrator operable unit are included as global tasks within the CTC for the groundwater sites.

RSA-112
FORMER DEMILITARIZATION & DISPOSAL SITE

SITE DESCRIPTION

RSA-112 is approximately 81 acres and is located in the east central part of the arsenal adjacent to RSA-58, east of Patton Road, south of Martin Road, and northeast of Creek Road. It is in the 100-year floodplain of the Huntsville Spring Branch and surrounded by wetlands. This site is bounded on the west by Corkern Range.

UXO is present at the site.

The site was used for demilitarization and disposal of chemical and conventional ordnance. This site consists of surface burn areas and one possible burn trench. The surface is littered with ordnance and debris.

RSA-112 and 128 were determined to be one demil area. RSA-128 will be listed as RC in AEDB-R and all needed action will be funded under RSA-112. This brought the site size to 81 acres. The original RSA-112 is fenced (58 acres) and the remaining part of the site has restricted access. The fence was installed in 2001.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-7
GW SITE #: RSA-145
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 81
RRSE RATING: Low
OE Yes
CONTAMINANTS OF CONCERN:
Metals, Explosives
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	198810	199009
SI	199510	199609
RI/FS	201001	201306
RA(C)	201306	201408
RA(O)	201408	201908
LTM	201908	204408

RIP DATE: 201408
RC DATE: 201908

CLEANUP STRATEGY

Additional RI/FS will be required due to increased acreage and groundwater sourcing potential. Directional borings will be included in the future investigation. LUC and 5-years reviews are expected to address site contaminants and UXO.

Surface water and sediment boundary of RSA-112 will be addressed in the anticipated Integrator OU along this segment of Huntsville Spring Branch.

RSA-113
INACTIVE DISPOSAL TRENCHES & BURN PITS

SITE DESCRIPTION

RSA-113 is two inactive disposal trenches, ~20 feet wide and 300 feet long each, located in the east central portion of arsenal, north of Creek Road, south of Martin Road, and east of Patton Road. Metal debris (e.g., decomposed drums, a rail cart, and structural steel) is visible in sections of the uncovered areas of the trenches. The 10-acre area is overgrown with vegetation including brush, briars, and small trees. The site was fenced in 2001.

Ordnance is scattered on the surface throughout the site. UXO is present on the surface.

Metals, explosives and CWM breakdown products were detected in soils.

CLEANUP STRATEGY

The PBC was awarded in 2005 and options exist to take this site to RIP and 5 years of RA(O) including 5 year review.

Land use controls will be implemented due to the presence of OE. This site will be addressed under IRP.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-7
GW SITE #: RSA-145
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 10.5
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals, Explosives, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199310	199509
RI/FS	200509	201012
RD	200509	201104
RA(C)	200509	201202
RA(O)	200509	201702
LTM	201702	204202

RIP DATE: 201202
RC DATE: 201702

Five-year reviews are planned. LTM will include cap and fence maintenance and the 5 year reviews for an indefinite amount of time. G roundwater monitoring may be added in subsequent revisions and CTC estimates if the investigation determines that PSA is present.

RSA-114
INACTIVE MADKIN MOUNTAIN ROCK QUARRY

SITE DESCRIPTION

RSA-114 is an abandoned limestone rock quarry that is located on the south side of Madkin Mountain, near the geographical center of the arsenal, north of the intersection of Neal Road and Mills Road. The rectangular shaped, water filled quarry is approximately 4 acres. Approximately 3 acres of the surrounding areas have been added as part of this site. The water level depth varies with wide seasonal fluctuations. After the quarry was closed during the mid-1940s, tons of surplus materials (e.g., soldier gas mask canisters, mustard chemical production plant filters) were disposed in the quarry. Large quantities of debris are currently visible above the water surface with the largest concentration being encompassed in two large piles on the southern side of the quarry. These two piles consist of gas mask canisters and large industrial charcoal canisters. The gas mask canisters and charcoal columns are believed to have been un-used. Underwater investigations have indicated the presence of intact, agent configured drums and 4.2 inch mortar rounds. This site was fenced in 2001.

April 2006, proposed for MMRP.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-4
GW SITE #: RSA-148
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 7
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals, UXO (CWM)
MEDIA OF CONCERN: Surface Soil, Surface Water

Phases	Start	End
PA	198810	198909
SI	198910	199609
RI/FS	201001	201212
IRA	201212	201402

RC DATE: 201402

CLEANUP STRATEGY

Additional RI/FS work will be completed with Tech Escort / US Army Engineering and Support Center - Huntsville providing construction support for access to quarry bottom and beneath gas mask piles. The investigation derived waste is expected to be disposed of as a hazardous waste. CWM ordnance and drums will be removed as part of the investigation. No additional remedial actions are planned.

RSA-117
FORMER LIQUID CAUSTIC MFG. PLANT SITE

SITE DESCRIPTION

Based on historical operations review and archive search RSA-117 (chlorine plant/50% caustic facility) has been expanded to include the full chlorine plant operations. RSA-238 captures the Northern portion of the WWII Plant #2 facilities, HS mustard Lines 5 and 6, IBF operations, the phosgene plant, ancillary buildings.

The RSA-117 operations have been demolished; however, the foundations are still evident. RSA-117 occupies ~85 acres, and is located east of Industrial Road, south of Mills Road, and west of Patton Road near the geographic center of RSA. The site is immediately adjacent to RSA-59. The area is vegetated primarily with grass and the areas north and west of the site are covered by stands of loblolly pine trees.

This area has also been expanded to include both RSA-104 Former GAF Discharge and RSA-118 which is within the southern drainage area. The former RSA-104 was the original drainage line from the former GAF facility that drained to the west. The former RSA-118 was a former ammonia lagoon used from approximately 1949 to the mid 1980s supporting the ISP, Inc. operations. Potential constituents in the discharge from the plant included sodium hydroxide, sodium hypochlorite and sodium chloride.

The DDT Drainage Ditches (RSA-105) will be investigated under this site.

An RI was started in the mid 1990's and indicated Arsenic and PCBs in the soil and groundwater. A draft focus feasibility study was developed in March 1999 after the dye trace study it was determined that additional information was needed before finalizing the document.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 85.2
RRSE RATING: Low
UXO RAC: No
CONTAMINANTS OF CONCERN: Metals, PCBs
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198810	198909
SI	198910	199009
RI/FS	200801	201106
RD	201105	201110
RA(C)	201110	201208

RC DATE: 201208

CLEANUP STRATEGY

Additional RI/FS work is needed to characterize the nature and extent of this revised area. A soil removal (1,000 cy) is planned for possible PCB hot spot removal. Removed soil will be disposed of in accordance with TSCA. Another soil removal of 4,074 cy is anticipated in the former RSA-118 area because of metals contamination which will be disposed of as non-hazardous material. Soil removal is planned to unrestricted use. Additional actions to address groundwater may be required based on RI findings; however, groundwater contamination is thought to be coming from off-site.

RSA-122
DISMANTLED LEWISITE MFG. PLANTS SITE

SITE DESCRIPTION

The site ~56 acres is located in the east central part of RSA, north of Viper Road and west of Meteorology Road. RSA-122 was the site of lewisite manufacturing (Plant #2) during the mid-1940s. This area consisted of 4 production lines. Lines 3 and 4 were active while lines 5 and 6 were never operational for the production of Lewisite, however, Line 5 area was used for decon of the one ton containers used for Lewisite storage and transportation. The area also includes an arsenic trichloride manufacturing plant whose waste was discharged to RSA-139. Subsequent development has partitioned the site. It is an active area with Testing, Measurement, and Diagnostic Equipment (Bldg 5435) and other operations. Disposal lagoons associated with this manufacturing area are identified as RSA-56, RSA-57, and RSA-139. Lines 3 and 4 discharged to RSA-56. Lines 5 and 6 were constructed to discharge to RSA-57. Mercury and arsenic contamination have been found in surface and subsurface soils as well as sediments.

In the 2004 supplemental RI, CVAA was detected in subsurface soils at the waste collection pit. This is a highly industrialized area on the Arsenal. This site also includes drainage for the entire area south across Mills Rd. ultimately to Huntsville Spring Branch. Site related contaminates have been detected in springs in a tributary that feeds into Huntsville Spring Branch.

The springs contamination will addressed under RSA-147.

A draft RI is currently under review. A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 55.6
RRSE RATING: High
OE: No
CONTAMINANTS OF CONCERN: Mercury, Arsenic, SVOCs, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198810	198909
SI	198910	199309
RI/FS	200301	200808
RD	200509	200812
RA(C)	200509	200911
RA(O)	200509	201411
LTM	201411	203911

RIP DATE: 200911
RC DATE: 201411

CLEANUP STRATEGY

Hot spot soil removals (2) and cap are anticipated and are included in the PBC. LUC and LTM will be necessary for the soils left in place below current building structures. Five 5 year reviews are planned. RA(O) will include annual monitoring for the first five year period. Subsequent sampling requirements will be based on the findings of the initial sampling period.

RSA-126
INACTIVE OPEN BURN TRENCH

SITE DESCRIPTION

RSA-126 is ~7 acres located near the geographical center of the arsenal, southwest of the intersection of Martin and Patton Roads. RSA-126 is made up of 2 trenches that were formerly used for open burning, and a surface burn area. Each trench is ~200 x 10 to 12 ft wide and 10 ft deep. The surface burn area is ~20 x 20 feet. No information is available about the period of operation or about the types and origin of materials burned in the trench. A long, narrow mound of soil is located at the west end of the trench, which is presumably the soil excavated from the trench. The site was fenced in 2001.

Metals were detected in the soil.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

CLEANUP STRATEGY

A PBC to address this site to remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: AB
TYPE NAME: Burn Area
SITE ACRES: 6.7
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199307	199609
RI/FS	200509	201012
RA(C)	200509	201012
RA(O)	200509	201512
LTM	201512	204012

RIP DATE: 201012
RC DATE: 201512

Additional RI/FS efforts are necessary to complete test pits of the trenches. A soil removal is planned, and removed material will be disposed as non-hazardous.

Administration of LUCs for industrial use and 5 year reviews will continue indefinitely.

RSA-134
INACTIVE DISPOSAL TRENCH & BURN PIT

SITE DESCRIPTION

RSA-134 consists of a disposal trench and open burning pit located east of Patton Road, south of Martin Road, and north of Creek Road. The site is located 100 feet from Creek Road in a marshy area. The trench is ~25 x 75 x 4 (deep) feet. It was reported to have been utilized as an open burning pit and/or a disposal trench. No primary records have been found that support this description.

Current historical records do not enable definitive determination as to UXO/CWM status. Additional archive search activities should provide a final determination.

The site is contaminated with metals in the groundwater, surface water and soils.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-7
GW SITE #: RSA-145
TYPE CODE: AB
TYPE NAME: Burn Area
SITE ACRES: 0.21
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198810	198909
SI	198910	199009
RI/FS	200509	201012
RA(C)	200509	201202
RA(O)	200509	201702
LTM	201702	204102

RIP DATE: 201202
RC DATE: 201702

CLEANUP STRATEGY

A PBC will address this site up to remedy in place followed by 5 years of RA(O) and a 5 year review.

A surface sweep and cap are anticipated. Administration of LUCs and maintenance of cap and fence will be required indefinitely. Four 5-year reviews are planned.

RSA-135H
INACTIVE SUMP FOR 1.1 PROPELLANT WASTES

SITE DESCRIPTION

This site is located on the west side of Building 7593 in the former Redstone Arsenal Rocket Engine South Plant. It is an inactive captive sump (no outlet) for containment of D.O.T. 1.1 propellant (explosive) wastes. The building was constructed in 1959 for cleanup of propellant de-aeration in the manufacturing of rocket propellant. RSA-135H collected building washdown water. The concrete-lined sump is 5 x 9 x 6 feet deep, and is covered by a wooden lid. The sump was periodically cleaned out and contents disposed of at the OB/OD area on Redstone.

PP--In 2004, the site boundary was expanded to include the waste storage pad (Bldg 7593 & 7594). The site is now 2.2 acres.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2.2
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199609
RI/FS	200801	201012
RD	201011	201104
RA(C)	201104	201202
LTM	201202	201702

RC DATE: 201202

CLEANUP STRATEGY

Based on the PA/SI, a RI/FS will be initiated to delineate the previously detected explosive contamination and to add perchlorate to the investigation. A sump removal (1,014 cy) is planned for explosives. The removed material will be disposed as non-hazardous. In situ bioremediation is planned for explosives and VOCs in soils. One 5 year review is planned. Annual monitoring will be required during the 5 year review period.

RSA-138M
INACTIVE TEMPORARY STORAGE AREA

SITE DESCRIPTION

This site is more accurately described as the ROP Tetryl Processing Line. The RSA-146 PSA effort identified additional process related facilities in this area that are now included in this site. It encompasses Buildings 7721 (146-PS-02A-01), 7722 (original 138M), 7723 (146-PS-02A-07), 7724 (146-PS-02A-06), 7725 (146-PS-02A-08) and associated ramps and drains in the former Redstone Arsenal Rocket Engine Facility North Plant. The expanded site boundary is now 8.8 acres. During the 1940s, this area was part of Redstone Ordnance Plant burster Line #2 which produced tetryl-based explosives components. After 1950, the buildings were used for various activities, including paint spraying and rocket motor propellant operations using D.O.T. 1.3 and 1.1 class explosives.

Explosives, perchlorate, SVOCs, VOCs and metals have been found in the soil. The groundwater is contaminated with perchlorate and VOCs, primarily TCE.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 8.8
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, Explosives, Perchlorate, SVOCs, VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199610	200109
RI/FS	200701	201006

RC DATE: 201006

In 2004, this site was expanded to include Bldg 7721, 7724, 7723, 7725 and 7722 and a temporary storage area the supported the Buster Line 2.

CLEANUP STRATEGY

Additional characterization is required to complete the RI/FS. Current data suggests that no action would be necessary.

Groundwater will be addressed under RSA-146.

RSA-139
CAPPED ARSENIC WASTE POND-NORTH

SITE DESCRIPTION

RSA-139 is a ~0.5 acre site located in the east-central part of the arsenal, north of Viper Road, west of Meteorology Road, and east of Calibration Road. It was an open, unlined surface impoundment that received waste discharge from arsenic trichloride manufacturing (included in RSA-122) facilities in the early 1940s. The site was capped with compacted clay and fenced in 1995. The soil/sediment contains high levels of metals, mainly arsenic.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

CLEANUP STRATEGY

A PBC will address this site up to remedy in place followed by 5 years of RA(O) and a 5 year review.

LTM consisting of cap and fence maintenance, 5 year reviews and LUCs administration are planned indefinitely.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-16
GW SITE #: RSA-147
TYPE CODE: SI
TYPE NAME:
Surface Impoundment/ Lagoon
SITE ACRES: 0.5
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198810	198909
SI	198910	199309
RI/FS	200509	200912
RA(C)	200509	201102
RA(O)	200509	201602
LTM	201602	204102

RIP DATE: 201102
RC DATE: 201602

RSA-140
INACTIVE DISPOSAL AREA

SITE DESCRIPTION

RSA-140 is located in the southeastern section of RSA, north of Buxton Road and south of the DRMO area. The site consists of two separate disposal mound areas (heights up to 7 feet) covering a total area of 320 square feet. The disposal mounds were found to contain construction-type materials (e.g. metallic objects, cement blocks, glass, charcoal, and insulation) from the 1960s and 1970s.

New historical search information indicates that RSA-140 and RSA-046 were part of a former range.

CLEANUP STRATEGY

RSA-140 will be reopened in AEDB-R. The RI/DD will be reviewed and revised as required.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-12
GW SITE #: RSA-146
TYPE CODE: DA
TYPE NAME: Surface Disposal Area
SITE ACRES: 3
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	199110	199209
SI	199210	199309
RI/FS	200901	201112

RC: 201112

RSA-141
4.2 INCH MORTAR DISPOSAL SITE, BLDG 4656

SITE DESCRIPTION

RSA-141 is a grass-covered field located adjacent to Building 4656, south of the former Huntsville Arsenal Plant No. 2. Between February 1992 and October 1994, a total of twenty 4.2-inch non-explosively-configured, empty (or water filled) mortar rounds were discovered buried at the site approximately one foot below the ground surface. Four additional 4.2-inch mortar rounds were found at the same site at a later date.

A chain-link fence was erected in 1995 as a safety precaution along the perimeter of the site.

In 1999, it was discovered that an industrial sewage outfall from a nearby NASA facility discharged into the middle of the site. This will complicate NASA's investigation of their underlying chlorinated solvent plume, as well as the proper division of cleanup responsibility.

This site is located within the MSFC boundary.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-18
GW SITE #: RSA-149
TYPE CODE: DC
TYPE NAME: Chemical Disposal
SITE ACRES: 11
RRSE RATING: Low
OE: Yes
CONTAMINANTS OF CONCERN: Metals, VOCs
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	199110	199202
SI	199203	199709
RI/FS	199710	201112
RA(C)	201112	201302
LTM	201302	203802

RC DATE: 201302

CLEANUP STRATEGY

Site will be transferred to the MMR (RSA-141-R-01) program.

Land use controls are necessary for the site. Five 5-year reviews and LUCs are included in the LTM estimate.

RSA-142
CHLORINATED-SOLVENT SPILL AREA

SITE DESCRIPTION

This site initially included vapor degreasing operations in former Building 7664. Additional buildings now included in the site are 7663 (146-PS-03A-14), 7676 (146-PS-03A-12), 7683 (146-PS-03EE), 7665 (146-PS-03A-08) and other associated facilities in the area. This area now includes a portion of the original ROP Burster Line 1. Subsequent Thiokol operations involved case prep, solid rocket motor loading and cleanup operations.

In 1989, a valve malfunction on the solvent reclamation still of the degreaser resulted in a reported spill of 30 gallons of TCE to a nearby ditch. Prior to connection to the sewer line, trench drains along the building feature discharged to the ditch and drained east toward the wetlands across East Line Rd. Data indicates significant releases of TCE and perchlorate to soil and groundwater.

The degreaser unit at this site was a vapor degreaser unit with a distillation unit similar to the degreaser/distillation units at RSA-094 through 98. The degreaser building was removed in the late 1990's.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 9.2
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Metals, VOCs, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	199110	199209
SI	199210	199509
RI/FS	200606	201005
RD	201004	201009
RA(C)	201009	201107
RA(O)	201107	201607

RIP DATE: 201107
RC DATE: 201607

RI work has been ongoing since the early 1990's. There are significant levels of TCE and perchlorate in the soil. Groundwater is addressed under RSA-146.

In 2004, the site boundary was expanded to 9.2 acres.

CLEANUP STRATEGY

Additional RI/FS is planned to complete the characterization of the TCE and perchlorate contamination in soil. Groundwater data suggests that NAPL is present at the site. Results indicate that treatment of both subsurface soils and groundwater is required. Therefore, the remediation must be sequenced with an initial dissolved-phase carbon injection for perchlorate followed by a chemical oxidation for TCE. Given the perchlorate levels in groundwater, resolution of EPA DOD issues regarding perchlorate remediation levels need to be resolved prior to selecting a remedial goal.

One 5 year review is planned. Groundwater will be addressed under RSA-146.

RSA-143
UNDERGROUND STORAGE TANK SPILL SITE

SITE DESCRIPTION

RSA-143 is located near the intersection of Goss Road and Vincent Drive, east of an existing service station, Building 3240. It is a gasoline spill site and was created by leaking underground storage tanks (USTs) and past operations. There were four original USTs that operated at this site for ~28 years, which serviced the closed AAFES service station. The tanks were previously removed, as well as soils around the tanks and lines, and the excavation was backfilled with clean soil and closed.

Groundwater is contaminated with high concentrations of lead, MTBE, benzene, ethylbenzene, toluene and xylenes. The design for in-situ oxidation remediation was completed in 2001.

A new service station (Class VI, Bldg 3234) was opened in 1996 up-gradient to the west, a release from which has contributed to the BTEX plume. This area is not part of RSA-143 and will be funded by compliance.

Chemical injections were initiated in August 2004. Subsequent monitoring revealed the presence of free product in wells where it was not previously detected. The initial injections were unsuccessful in treating the dissolved phase plume due to residual LNAPL presence.

The free product has been delineated. Enhanced fluid recovery has been performed.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-1
GW SITE #: RSA-146
TYPE CODE: SS
TYPE NAME: Spill Site Area
SITE ACRES: 5.75
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: BTEX, MTBE, Lead
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
ISC	199310	199409
INV	199410	199609
CAP	199610	200405
IMP(C)	200405	200409
IMP(O)	200409	200807

RIP DATE: 200409
RC DATE: 200807

CLEANUP STRATEGY

Groundwater monitoring and an updated Tier II report will be repaired.

The old site will be closed using the ADEM UST process.

NOTE: the new spill site [up gradient to west] will require a separate report using the installation O&M funds.

RSA-144
CHLORINATED-SOLVENT DISTILLATION UNIT 6

SITE DESCRIPTION

This site is located at Building 7554 in the former Redstone Arsenal Rocket Engine Facility South Plant. In the 1940s, the building was used for rocket motor casting and processing. Degreasing, painting and storage activities took place at this site in association with rocket propellant research, development and manufacturing.

The site boundary was expanded because of the results of the PA investigation. This now includes Bldg 7552, 7554, 7555 and the Motor Cleaning Shed. The site is now 5.4 acres.

A SI indicated low levels of metals and TCE in the soil. Groundwater beneath this unit has high levels of TCE and is being addressed under RSA-146.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 5.4
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	199510	199609
SI	199610	199709
RI/FS	200701	200912
RD	200911	201004
RA(C)	201004	201102
RA(O)	201102	201602

RIP DATE: 201102
RC DATE: 201602

CLEANUP STRATEGY

Based on PA/SI information, a RI/FS for surface media is required. Sampling for chlorinated solvent and perchlorates will be included, as well as groundwater sourcing determination. In situ oxidation is planned to address the TCE found in subsurface / deep soils and DNAPL secondary source material in groundwater. Remedial actions currently planned do not include any action for perchlorates in soil, based on historical site operations.

If the current RI investigation, which includes further investigation of perchlorate in soils, renders data that suggests a perchlorate action is needed, one will be included in future revisions and CTC estimates.

One 5 year review is planned. Annual monitoring is planned for the first five year review period to determine the effectiveness of the remedy.

RSA-145
GROUNDWATER UNIT GW-01

SITE DESCRIPTION

This groundwater site includes: RSA-5, 8, 45, 48, 58, 112/128, 113, 134, 143 and D. Proposed sites include RSA-228, 229, 230, 231, 232, 233, 234, 235 and 236 as a result of the PSA effort for RSA-145.

Current groundwater data indicates that sources other than those within RSA-145 may exist and are contributing to groundwater contamination. Multiple contaminated off-site groundwater and surface flows enter this site. Groundwater contaminants surface through multiple springs, resulting in surface water contamination, much of which occurs at Wheeler Wildlife Refuge. TCE has been found to stay consistent at low levels along creeks as they flow through the arsenal. There are both losing and gaining reaches of stream segments. Based on these findings, the use of an IOU (Integrator OU) and perimeter well network will be required to evaluate the cumulative effects of these inputs.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 9,900
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
TCE
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	199001	199102
SI	199406	199709
RI/FS	199710	201012
RA(C)	201012	201202
RA(O)	201202	201702
LTM	201702	204202

RIP DATE: 201202
RC DATE: 201702

CLEANUP STRATEGY

Complete the RI/FS for the groundwater site. Completion of RI/FS investigation at surface media sites with respect to their contributions to groundwater contamination to RSA-145 needs to be coordinated in terms of timing. In FY05, a perimeter well network is scheduled to be installed.

It is expected that once the potentially contributing sites to groundwater contamination have been addressed, the integrator operable units and perimeter well program will be an integral part of the final remedy. It is anticipated that no further groundwater remedial action will be necessary beyond monitoring.

Groundwater monitoring [32 wells (25% of existing wells) x 10 years] will follow. Planned abandonment of 75% of 120 current wells is included in the CTC estimate in the RA(C).

Five-year reviews and LUCs are planned.

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RSA-146

GROUNDWATER UNIT GW-02 (PAGE 1 OF 2)

SITE DESCRIPTION

This groundwater site includes: RSA-46, 64, 82, 83, 87, 88, 89, 94, 95, 96, 97, 98, 99, 129, 138M, 135H, 140, 142, 144, A and C (~10 square miles). Proposed sites include RSA-187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221 and 222 as a result of the PSA effort for RSA-146.

This groundwater site is the source of the off-post groundwater contamination. Groundwater contaminants surface through multiple springs, resulting in surface water contamination both on and off post. TCE and perchlorate have been found in the groundwater and surface water. Several DNAPL sources are known to be located in this groundwater site. Groundwater contamination could be contributing to indoor air vapor intrusion issues on post. Contamination from the source areas are co-mingled and wide-spread. The drinking water for the community around this area of the arsenal comes from the Tennessee River.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 6,600
RRSE RATING: High
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives, Perchlorate
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	199009	199102
SI	199406	199709
RI/FS	199710	201012
RD	201011	201104
RA(C)	201104	201202
RA(O)	201202	202202
LTM	202202	204202

RIP DATE: 201202
RC DATE: 202202

CLEANUP STRATEGY

Complete the RI/FS for the groundwater site. Completion of RI/FS investigation at surface media sites with respect to their contributions to groundwater contamination to RSA-146 needs to be coordinated in terms of timing.

Evaluate impact of this area on Integrator OU(s). Evaluate the appropriate goal and most efficient use of pump and treatment systems in overall groundwater remedial program. Perform treatability studies for perchlorate and TCE. The results of these studies will assist in making informed decisions at this and other sites.

It is anticipated that the RI will identify other required remedial actions. These actions may include in situ or pump and treatment (existing treatability studies) actions for secondary sources in groundwater. Included in the CTC are additional (12) extraction wells for the existing pump and treatment systems. The extraction wells will be designed to target both TCE and perchlorate secondary sources in groundwater.

Both systems will be modified to include a bio-reactor for the treatment of perchlorate with a common discharge to Huntsville Spring Branch. Ultimate RD/RA selection will be based on treatability study results and individual site parameters.

Assuming the injection process is not successful in removing sufficient DNAPL to significantly affect groundwater concentrations of concern, and also assuming that exposure scenarios are acceptable, the establishment of a Containment Zone with a TI Waiver will be pursued, with monitored natural attenuation as the expected long-term remedy.

Offsite LTM program for surface water, sediment, and groundwater monitoring will be performed for 10 years.

Groundwater monitoring (40 wells for 10 years) will follow. Five-year reviews are planned. RA(O) costs include eight years of operation of the current pump and treat systems, LUCs, groundwater monitoring of the 40 wells, and abandonment of 300 wells (75% of approximately 400).

RSA-147
GROUNDWATER UNIT GW-03

SITE DESCRIPTION

This groundwater site includes: RSA-54/55, 56, 57, 59, 104, 117, 118, 122, 126, 139 (~3 square miles). Proposed sites include RSA-223, 224, 225, 226 and 227 as a result of the PSA effort for RSA-147.

The contaminants in this groundwater site consist primarily of metals and TCE. There are still several unknown sources of the contamination, since the known sources do not include all the contaminants in the groundwater.

Groundwater contaminants surface through multiple springs, resulting in surface water contamination. Several springs within the Huntsville Spring Branch, to the south of this groundwater site, contain high levels of chlorinated solvents.

The central dye trace study indicates the possible interconnection of groundwater sites RSA-147, RSA-148 and RSA-149.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 1,300
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	199006	099102
SI	199407	199709
RI/FS	199710	201112
RD	201111	201204
RA(C)	201204	201302
RA(O)	201302	202302
LTM	202302	204302

RIP DATE: 201302
RC DATE: 202302

CLEANUP STRATEGY

Complete the RI/FS for the groundwater site. Completion of RI/FS investigation at surface media sites with respect to their contributions to groundwater contamination to RSA-147 needs to be coordinated in terms of timing.

Remediation may include a reactive wall for arsenic and chlorinated solvents at former HVA Plant #2 lewisite area (RSA-122, 56, 57 and 139).

Groundwater monitoring (25 wells for 10 years) will follow. Planned abandonment of 75% of 148 current wells is included. Five-year reviews and LUCs are planned.

RSA-148
GROUNDWATER UNIT GW-04

SITE DESCRIPTION

Includes: MSFC-74, RSA-10, 27, 49, 53, 60, 61, 62, 114, and 183 (~6.7 square miles)

New possible PSA areas that have been identified at this time include Salvage Yard, Small Arms Ranges etc. The archive search report and visual site inspection will be completed for this site to verify.

This groundwater site drains to the Huntsville Spring Branch, within the boundaries of the Wheeler National Wildlife Refuge. The primary contaminants of concern in this area are chlorinated solvents and DDT. Two plumes of chlorinated solvents in this groundwater site are co-mingled with plumes from the NASA area on the arsenal. There are several springs that empty into the Huntsville Spring Branch that contain very elevated levels of chlorinated solvents. This site is likely to be significantly impacted by contamination originating at the Marshall Space Flight Center.

The central dye trace study indicates the possible interconnection of groundwater sites RSA-147, RSA-148 and RSA-149.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 3,600
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	199006	199102
SI	199407	199709
RI/FS	199710	201112
RA(C)	201112	201302
RA(O)	201302	201802
LTM	201802	204302

RIP DATE: 201302
RC DATE: 201802

CLEANUP STRATEGY

Finish groundwater investigation from existing sites (8). Complete source characterization of possible PSA areas in order to evaluate relative impact to groundwater contamination and overall risk assessment. This groundwater site includes both MSFC and RSA sites that contribute to co-mingled groundwater contamination. Responsibility for investigation and remediation of this groundwater contamination must be resolved. Resolution of this issue will significantly affect the cost and schedule of completing this site.

Prepare position paper and obtain written concurrence from regulators concerning characterization and relative contribution of Olin vs. MSFC/RSA wastes (DDT, chlorobenzene, etc.) contamination in the southern portion of RSA-148 (probable Integrator Operable Unit area). Ultimate RD/RA selection will be based on treatability study results and individual site parameters. LUCs are 5-years reviews are planned. Groundwater monitoring (20 wells for 10 years) will follow. Planned abandonment of 75% of 244 current wells. Five 5 year reviews are planned. Included in LTM are the final four 5 year reviews.

RSA-149
GROUNDWATER UNIT GW-05

SITE DESCRIPTION

Includes: MSFC-2, 3, 34, 53, 77, 82, D, RSA-9, 52, 63, 109, and 141 (~9 square miles)

New possible source area: Railroad Spring Disposal Area.

Several plumes, co-mingled with plumes from NASA activities, are located within this groundwater site. Data indicates that not all source areas and flow pathways have been identified. Due to karst geology, this groundwater moves to the springs emptying into the Huntsville Spring Branch within Wheeler National Wildlife Refuge. This site is significantly impacted by contamination originating at the Marshall Space Flight Center.

The presence of a threatened small fish species (Alabama Darter) will increase the ecological concern.

The central dye trace study indicates the possible interconnection of groundwater sites RSA-147, RSA-148 and RSA-149.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 3,900
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	199006	199102
SI	199407	199709
RI/FS	199710	201112
RA(C)	201112	201302
RA(O)	201302	201802
LTM	201802	204302

RIP DATE: 201302
RC DATE: 201802

CLEANUP STRATEGY

Finish groundwater investigation from existing sites (13). Complete source characterization of possible PSA areas (Railroad Spring) in order to evaluate relative impact to groundwater contamination and overall risk assessment.

This groundwater site includes both MSFC and RSA sites that contribute to co-mingled groundwater contamination. Responsibility for investigation and remediation of this groundwater contamination must be resolved. Resolution of this issue will significantly affect the cost and schedule of completing this site. For example, remedial actions would need to be implemented in identified areas such as HRC injections near MSFC-3/82 (carbon tet, TCE) and MSFC-34 (carbontet, TCE, PCE, chloroform). Both parties currently deny responsibility for the groundwater contamination present in these areas.

Ultimate RD/RA selection will be based on treatability study results and individual site parameters. LUCs and 5-years reviews are planned. Groundwater monitoring (20 wells for 10 years) will follow. Planned abandonment of 75% of 89 current wells.

RSA-150
GROUNDWATER UNIT GW-06

SITE DESCRIPTION

- North central portion of installation
- No current IRP sites
- PSA north railroad classification yard, small arms range, airfield.

CLEANUP STRATEGY

The PSA work has been completed. The report is expected to be submitted to the regulators in third quarter FY06.

There is insufficient data at this time to plan remedial action.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 10,400
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	200401	200406
SI	200410	200702
RI/FS	200904	201206
LTM	201206	203706

RC DATE: 201206

RSA-151
GROUNDWATER UNIT GW-07

SITE DESCRIPTION

Includes: RSA-13, 14, 110 (~1.5 square miles)

A large plume containing chlorinated solvents and perchlorate exists in this groundwater site. DNAPL has been identified. This site is located along the Tennessee River, 1 mile upstream of the arsenal's drinking water intake. RSA-151 is located on TVA property. Work continues to determine if any of the contamination is moving into the river, where it would have the potential to impact the arsenal's drinking water. Perchlorate has not been characterized, but has been found in extremely elevated amounts in surface water and groundwater. The presence of archeological sites will increase the investigation cost. There is an active range with this site.

A Pump and Treat system was operated (to treat VOCs) in this area from 1997-99 and was shut down because of perchlorate issues.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 570
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	199006	199102
SI	199407	199709
RI/FS	199710	201112
RD	201111	201204
RA(C)	201204	201302
RA(O)	201302	202302
LTM	202302	204302

RIP DATE: 201302
RC DATE: 202302

CLEANUP STRATEGY

Additional RI/FS work will be completed to delineate the CWM breakdown products, perchlorate, and further DNAPL delineation with depth. Exit pathway well results are being evaluated to determine if investigation may be necessary on the other side of the Tennessee River. Planned remediation includes sequential ex situ treatment for VOCs and perchlorate at the RSA-13/14 area following coordination with OB/OD activities. LUCs and 5-year reviews are planned.

Evaluate and implement short term action for perchlorate in surface water (embayment) by monitoring the Redstone Arsenal drinking water intake (funded in FY05).

Groundwater monitoring (10 wells for 10 years) will follow. Ultimate RD/RA selection (fluidized bed reactor) will be based on treatability study results and individual site parameters. Planned abandonment of 75% of 169 current wells.

RSA-152
GROUNDWATER UNIT GW-08

SITE DESCRIPTION

Includes: RSA-32, 65, 66, 67, 68, 69/70 (~ 2 square miles)

No new PSA areas have been identified at this time. The archive search report and visual site inspection was completed.

The groundwater has been found to contain elevated levels of chlorinated solvents and breakdown products of mustard agent. This unit is located along the Tennessee River, adjacent to the area where the arsenal's drinking water is pulled from the river. Very little characterization has been done in this groundwater site due to the amount of UXO on the surface/subsurface and the remote location on the arsenal.

CLEANUP STRATEGY

A limited site assessment will be completed in spring 2005 (funded). Finish groundwater investigation from existing sites (6). Complete source characterization of possible PSA areas in order to evaluate relative impact to groundwater contamination and overall risk assessment.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 890
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	199006	199102
SI	199407	199709
RI/FS	199710	201112
RD	201111	201204
RA(C)	201204	201302
RA(O)	201302	202302
LTM	202302	204302

RIP DATE: 201302
RC DATE: 202302

Groundwater monitoring (20 wells for 10 years) will follow. Ultimate RD/RA selection (pump & treat) will be based on treatability study results and individual site parameters. Groundwater extraction and treatment is expected at this unit. Planned abandonment of 75% of 97 current wells. LUC and 5-year reviews are planned.

RSA-153
GROUNDWATER UNIT GW-09

SITE DESCRIPTION

This groundwater site is located along the western side of Redstone. There are no currently identified surface sites in this groundwater site. Numerous sink holes are present that may have been dump areas. There is a Public Supply well with low levels TCE but the source expected to be off post.

CLEANUP STRATEGY

The PSA work has been completed. The report is expected to be submitted to the regulators in third quarter FY06.

There is insufficient data at this time to plan remedial action.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 6,300
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	200401	200406
SI	200410	200702
RI/FS	200901	201206
LTM	201206	204206

RC DATE: 201206

RSA-154
GROUNDWATER UNIT GW-10

SITE DESCRIPTION

This groundwater site is located in the center lower part of the Arsenal. Static Test Fire Activities are conducted in this area.

There are no currently identified surface sites in this groundwater site.

CLEANUP STRATEGY

The PSA work has been completed. The report is expected to be submitted to the regulators in third quarter FY06.

There is insufficient data at this time to plan remedial action.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 3,300
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	200401	200406
SI	200410	200702
RI/FS	201001	201306
LTM	201306	204306

RC DATE: 201306

RSA-155
GROUNDWATER UNIT GW-11

SITE DESCRIPTION

Detected concentrations of VOCs were found in the exit pathway well clusters 1 and 2 located within RSA-155. This contamination may be attributed to sources within this groundwater site (new possible PSA areas: e.g. dock storage area, Gulf Chem Warfare Depot open air drum storage area, etc.) but may be associated with sources within RSA-149 (NASA). This unit is located along the Tennessee River, where the arsenal's drinking water is pulled from the river. This site is within an active range.

RRSE for this site is currently being evaluated.

CLEANUP STRATEGY

Complete source characterization of possible PSA areas in order to evaluate relative impact to groundwater contamination and overall risk assessment.

NFA is expected.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 1,600
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	200401	200406
SI	200410	200702
RI/FS	200901	201206

RC DATE: 201206

RSA-156
GROUNDWATER UNIT GW-12

SITE DESCRIPTION

Includes: RSA-115 (RSA-116 was transferred to the RCRA program based on its operational range status) (~2.5 square miles)

New possible source areas: GCD Igloos and associated dock areas, possible quarry/borrow area, etc.

This groundwater site is located along the Tennessee River, ~5 miles upstream of the arsenal's drinking water intake. Low levels of TCE have been found in the groundwater. Perchlorate has been found in low levels, but has not been characterized. This site is within an active range.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME: Contaminated Groundwater
SITE ACRES: 1,400
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate
MEDIA OF CONCERN: Groundwater

Phases	Start	End
PA	199006	199102
SI	199407	199709
RI/FS	201001	201306
RA(C)	201306	201409
RA(O)	201409	201909
LTM	201909	204409

RIP DATE: 201409
RC DATE: 201909

CLEANUP STRATEGY

Complete source characterization of possible PSA areas in order to evaluate relative impact to groundwater contamination and overall risk assessment. Finish groundwater investigation including perchlorate characterization. Transfer RSA-115 from CERCLA to RCRA based on its operational range status. No active remediation is expected. LUC and 5-year reviews are planned.

Groundwater monitoring (5 wells for 10 years) will follow. Planned abandonment of 75% of 32 current wells.

RSA-157
GROUNDWATER UNIT GW-13

SITE DESCRIPTION

This groundwater site is located in the lower east portion of the arsenal on the Tennessee River. The old magazine area is located in this site. The industrial water supply intake is located at bldg 5428.

There are no currently identified surface sites in this groundwater site.

CLEANUP STRATEGY

Primary purpose is to understand groundwater flow in order to plan and justify GW efforts down gradient.

STATUS

REGULATORY DRIVER: CERCLA
TYPE CODE: CG
TYPE NAME:
Contaminated Groundwater
SITE ACRES: 1,100
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals, SVOC, VOCs, Explosives
MEDIA OF CONCERN:
Groundwater

Phases	Start	End
PA	200401	200406
SI	200410	200801
RI/FS	201001	201306

RC DATE: 201306

RSA-183
FORMER LEWISITE PRODUCTION FACILITY

SITE DESCRIPTION

This site was created to include the lewisite manufacturing lines 1 and 2 with the exception of the capped arsenic waste lagoon (RSA-49). This site also includes the large drainage feature approximately 1.5 miles to the south that could have potentially received all drainage from both RSA-183 and RSA-49. RSA-183 is located south of Neal Road at the Toftoy Thruway intersection and covers approximately 140 acres. Portions of the area are presently used as a parking lot for a series of trailers and buildings including Bldg 4381.

The surface soils in the production areas are contaminated with arsenic and mercury. In the 2004 supplemental RI, CVAA was detected in subsurface soils at the waste collection pit and chlorinated solvents (carbon tet) was detected in the groundwater.

A PBC has been awarded to include remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-5
GW SITE #: RSA-148
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 140
RRSE RATING: High
OE: No
CONTAMINANTS OF CONCERN: Metals, SVOCs, VOCs, CWM
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment, Surface Water

Phases	Start	End
PA	198910	199009
SI	199010	199609
RI/FS	200301	200808
RD	200509	200812
RA(C)	200509	200911
RA(O)	200509	201411
LTM	201411	203911

RIP DATE: 200911
RC DATE: 201411

CLEANUP STRATEGY

A PBC will address this site from FS to remedy in place followed by 5 years of RA(O) and a 5 year review.

RI efforts are currently on-going to investigate the complete Lewisite production area. The draft RI is currently under review.

LTM consisting of cap maintenance, 5 year reviews and LUCs administration are planned indefinitely.

RSA-187
NORTHERN THIOKOL MIXING FACILITY

SITE DESCRIPTION

Buildings 7386 and 7387 (demolished) were constructed in 1965 for use by Thiokol as a propellant mixing facility. The primary activity was mixing batches of class 1.1 or 1.3 propellants. These buildings were located north of Sandpiper Road in the vicinity of the former Burning Ground #3.

Propellant was mixed and poured into casting cans within these facilities. The greatest potential for release was related to the mixing process (i.e., overflow or spilling) and pouring the propellant mixture from the mixers into the casting cans. Although not documented, it is possible that the mixers were cleaned on the premises. Therefore, it is possible that solvents were used to clean propellants from the mixers upon batch completion.

Concrete sumps (RSA-135d and 135e) were located on the northwest side of the buildings and reportedly used for collection of propellant wastes. In addition, temporary storage areas (TSA) (RSA-136g and RSA-136h) located northeast of the buildings, were reportedly used for storage of propellant and solvent wastes. The sumps and TSA have been removed.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 4.1
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, Explosives, Perchlorate, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112
RD	201111	201204
RA(C)	201204	201302

RC DATE: 201302

CLEANUP STRATEGY

Additional RI/FS planned. Soil excavation with on site treatment is expected to be needed to address soil contamination.

RSA-188
NORTHERN BURIAL AREA/BURNING GROUND (#3)

SITE DESCRIPTION

The Northern Burial Area (NBA) appears to have been used by the Army and Thiokol from the early 1940s into the late 1950s. NBA was identified as a scarred area on aerial photographs from 1943 to 1959 and is located north of Sandpiper Road and the RARE North Plant fence line. The area is not visible in 1964 photographs.

At this time, it is unknown what types of wastes were disposed at this site. Early photographs show a road leading from Burning Ground #3 to this area. It is probable that debris from activities at Burning Ground #3 were disposed in the NBA.

Other types of materials disposed in the Northern Burial Area and evident on the ground surface include concrete debris, clay tiles, and building debris. A surface depression near monitoring wells RS692 and RS697 expose the topsoil where charred debris and rubbish were noted during a 1999 visit. Geophysical surveys performed to date have identified eleven subsurface anomalies suspected to result from buried metal (potentially UXO).

During the 2003 VSI, bare soil was noted around the perimeter of a north-sloping depressed area with no clearly defined drainage channels. Two areas of debris were observed. One included the base plate from a 75-mm high-explosive projectile, as well as steel plates, brick, concrete, and 2-inch-diameter pipes. The other contained only general debris, such as bricks and pipes.

Burning Ground #3 appears to have also been used by the Army and Thiokol from the early 1940s into the 1960s. This area exists as a bermed area in the shape of a "W" on aerial photographs from 1943 to 1964 but is barely visible in 1976 photographs. It is suspected that this area was used for burning small quantities of chemicals and production wastes, munitions after testing, and munitions from ROP operations. Reportedly, this burning ground was not used by Thiokol for disposal or burning after 1961.

Geophysical surveys to date have identified five subsurface anomalies suspected to be caused by buried metal (potentially UXO). Due to the discovery of a 30-mm shell during the spring of 2001, Burning Ground #3 is considered a UXO concern.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: XE
TYPE NAME:
Explosive Ordnance Disposal Area
SITE ACRES: 6.6
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
VOCs, Metals, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112
RD	201111	201204
RA(C)	201204	201302
RA(O)	201302	201802
LTM	201802	204302

RIP DATE: 201302
RC DATE: 201802

NORTHERN BURIAL AREA/BURNING GROUND (#3)

This is located on an active range.

CLEANUP STRATEGY

An RI/FS will be completed. SVE followed by LUCs are anticipated.

Five 5-year reviews are planned. One year of SVE, one 5-year review, and LUCs for the first 5 year period are planned as RA(O). The remaining four 5-year reviews and LUCs are included in the LTM estimate.

RSA-189
MOTOR/OXIDIZER PREP FACILITIES

SITE DESCRIPTION

The Army built Buildings 7738 and 7739 in 1945. During ROP operations, Building 7738 was used as a tetryl service magazine. It became the primary tetryl receiving and screening facility for Line 2. Tetryl was received by rail at the loading platform, unloaded, and the containerized tetryl was transferred by hand cart into the screening room. The screening process involved raking 100-pound batches of tetryl through a screen with wooden paddles. Similarly, 7739 served as the primary TNT service magazine. It later became the primary TNT receiving and screening facility for Line 2.

Following acquisition by Thiokol (circa 1950), Building 7738 was used for rocket motor soakout from 1959 until sometime in the 1960s. Motor soakout involved soaking motors in a vat of methylene chloride or benzyl mercaptan until all propellant was removed from the rocket. During the mid to late 1960s, Building 7738 was used for particle separation using a water table. From 1964 to 1969, this facility was used as an oxidizer grinding facility. Oxidizer (ammonium perchlorate) was received and ground in a roller mill to a very fine powder. Subsequently, Building 7738 was used for nozzle flow smoke testing of smoke grenades. Sometime in the 1970s, the facility was again employed as an oxidizer grinding building. In 1982, Building 7738 became a control building for grinding operations in Building 7739.

Following acquisition by Thiokol (circa 1950) and throughout the 1950s and 1960s, Building 7739 was used for rocket motor loading and processing. Motor loading and processing involved loading propellant into rocket motor assemblies. From 1969 on, this facility was used as an oxidizer grinding facility. Oxidizer (ammonium perchlorate) was received at the facility and ground in a roller mill to a very fine powder. Ground oxidizer was containerized and transferred to a mixing building for further processing.

The buildings have been removed, however sumps are still place.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.3
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Metals, VOCs
MEDIA OF CONCERN:
Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201206
RA(C)	201205	201206

RC DATE: 201206

CLEANUP STRATEGY

Additional RI/FS is planned. Future sampling should target sumps, settling tanks and operation facilities. Removal of the sumps/drains is expected.

RSA-190
DISPOSAL/DRAINAGE AREA WEST OF ROP (LINE 2)

SITE DESCRIPTION

This disposal/drainage area is first discernible in 1956 aerial photographs. In 2000, concrete debris and rebar were noted in the wooded section of the area. During the 2003 VSI, three piles of soil/debris and two converging drainage channels were observed in the wooded area. One channel received drainage from the area east of Curlew Circle, where Buildings 7726 (RSA-97), 7738 (RSA-189), and 7739 (RSA-189) formerly stood.

CLEANUP STRATEGY

Additional RI is planned. No further action is expected.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: DA
TYPE NAME: Surface Disposal Area
SITE ACRES: 3.6
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOC, Explosives, Metals, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

RSA-191

ROP LINE 1 SERVICE FACILITIES

SITE DESCRIPTION

Building 7643 was constructed in 1956 for use as a paint spray building. Thiokol used the building from 1958 to 1975 as a motor cleaning facility. Motors were cleaned by degreasing with solvents and PF degreaser. From 1975 to 1986, Building 7643 was used for core cleaning and assembly. Each core was cleaned with solvents. From 1986 to 1996, this facility was used as a carpentry shop and maintenance facility. In 2004, low levels of perchlorate were detected in soil & groundwater.

Building 7666 was originally constructed by the Army in 1942 and used as a packing and shipping building for Line 1. It is assumed that this facility received inert materials such as packing boxes, pallets, and steel strapping during ROP operation. Following acquisition by Thiokol in 1950, Building 7666 was used as a change house until the mid 1950s, when it became a control laboratory. Quality of finished rockets and manufactured propellants was tested in this facility. It is possible that X-ray evaluation and film development also occurred at this facility. In the early 1980s, Building 7666 became a change house again until demolition in the early 1990s. In 2004, low levels of perchlorate were detected in soil and groundwater and VOCs were detected in soil.

Building 7667 was originally constructed by the Army in 1942 and was used during early ROP operations as a change house for Line 1. Following acquisition by Thiokol in 1950, Building 7667 was used as a first-aid facility and a control laboratory. Materials testing took place in this facility. Details regarding laboratory operations are unavailable. The laboratories on the main floor and second floor had drains that reportedly drained to the sewer system. The basement contained a storage area and a boiler room. In 1996, three storage sheds were observed south of the building (one of which had a captive sump) and were reportedly used for waste solvents/explosives. Two of the sheds held 5-gallon containers of waste materials. An open-air wood rack also contained approximately 100 ½-gallon glass jars of acids (acetic, nitric, sulfuric, and hydrochloric). Various gas cylinders were visible on storage racks located outside Building 7667. In addition, a horizontal AST located on the southeast corner of the building contained air and nitrogen (N2) for a strand burner. In 2004, perchlorate was detected in soil and groundwater.

Building 7686 was originally constructed by the Army in 1942 and was used as a solvent storage shed. Following acquisition by Thiokol in 1950, Building 7686 remained a solvent storage shed until demolition in the mid 1980s.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 3.0
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, PRO, Metals, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

ROP LINE 1 SERVICE FACILITIES (PAGE 2 OF 2)

Solvents stored in this facility were used in the adjacent building (Building 7643) for cleaning and degreasing. In 2004, low levels of TCE were detected in the soil.

RCRA sites RSA-178 and RSA-179 are located within the site boundary of RSA-191.

CLEANUP STRATEGY

Additional RI is planned for all areas.

There is insufficient data at this time to plan remedial action.

RSA-192
TETRYL AND IGNITER PROCESSING (ROP LINE 1)

SITE DESCRIPTION

Building 7651 was originally constructed by the Army in 1942, and used by ROP as a tetryl service magazine. This facility was used for receiving, storing, and opening tetryl. Following acquisition by Thiokol, the building was used as a thermal stability oven from 1950 to 1975. From 1975 to 1995, Building 7651 was used for storage. In 2004, perchlorate and TCE was detected in groundwater; metals were detected in soil.

The Army built Building 7652 in 1942 which was used during ROP operations for tetryl screening and blending. The tetryl was placed onto a screen and raked it with wooden paddles. Screened tetryl was collected in tote boxes and transferred to Building 7653 for pelleting. From acquisition by Thiokol (circa 1950) until the mid/late 1960s, this building was listed as an ammonium perchlorate grinding facility. Ammonium perchlorate would have been put into a mill for grinding to a fine powder. During the 1970s, Building 7652 was a freeze dryer where HMX and RDX were reportedly stored. From 1980 to 1995, Building 7652 was listed as an oxidizer grinding facility. In 2004, perchlorate was detected in soil and groundwater.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 6.1
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, Explosives, Metals, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201106
RA(C)	201105	201106

RC DATE: 201106

Building 7653 was originally constructed by the Army in 1942 as a blended tetryl rest house for ROP Line 1. Following acquisition by Thiokol in 1950, Building 7653 was used for grinding 4,4-methylene-bis[2-chloroaniline] (MOCA), nitramine drying, and propellant curing. In 2004, perchlorate was detected in groundwater.

Building 7654 was built by the Army in 1942 as to support early ROP operations as a tetryl pelleting facility for Line 1. Tetryl pellets were created by placing small amounts of the tetryl blend into a hopper that fed the pelleting press. Each press was cleaned with acetone after each shift. Following acquisition by Thiokol in 1950, Building 7654 was used as a reaction laboratory until the late 1970s. It is assumed that operations in this facility involved testing of propellants and other rocket motor additives. Thiokol documentation indicates that freeze drying of ammonium perchlorate took place in this facility during the 1950s. From the late 1970s to the early 1990s, Building 7654 was used as a small rocket motor manufacturing facility. Degreasing, painting, curing, and small scale mixing and casting might have taken place in this building.

TETRYL AND IGNITER PROCESSING (ROP LINE 1)

In 1996, a waste sump (RSA-135L) was found to be associated with this building. Numerous storage pads observed around Building 7654 were used to store class-1.1 propellant wastes. Waste PCE discharge to the industrial sewer system has been documented at this building. In 2004, TCE was detected in groundwater.

Building 7655 was built by Thiokol in 1956. Building number indices from 1956 to 1991 list Building 7655 as a machine cleaning facility until the late 1970s, thereafter, the documented use is as a pyrogen igniter manufacturing facility. In 2004, TCE and perchlorate was detected in groundwater.

Building 7662 was originally constructed by the Army in 1942 as a tetryl pellet rest house for Line 1. Following acquisition by Thiokol in 1950, Building 7662 was used as a curing oven and class-1.3 propellant mixer building. Curing operations consisted of exposing propellants developed in a laboratory in Building 7654 to extreme temperatures in ovens to encourage hardening. Thiokol's general procedure for mixing propellant was a stepped approach to make batches of class-1.1 or -1.3 propellant in various quantities. See RSA-187 for process description. Building 7662 was probably a small-scale mixer facility (less than 5-gallon batches). Propellant was mixed and then poured into casting cans at this facility. The greatest potential for contaminant release was related to the mixing process (i.e., overflow or spilling) and pouring the propellant mixture from the mixers to the casting cans. In 2004, perchlorate was detected in the soil.

Building 7660 was constructed by Thiokol in 1958 for use as a tool cleaning facility. Tool cleaning involved removing excess propellant wastes and grime from tools and equipment, from the two motor assembly lines, mixing facilities, and casting facilities. Tools were cleaned using wire brushes, high pressure spraying, and solvent degreasing in small vats. Historical documentation indicates that four large methylene chloride storage tanks were located at this facility. In 1996, two TCA drums were noted on portable racks outside the northeast corner of the building. One of the degreaser vats appeared to contain approximately 10 to 20 gallons of TCA. In 2004, perchlorate was detected in groundwater.

A propellant waste storage pad (RSA-138i) was observed north of the building. An east-west trending ditch to the south had very little vegetation, compared to surrounding areas. A concrete pad was noted leading to the southwest and ending where a piece of equipment had been moved.

CLEANUP STRATEGY

Additional RI/FS is planned for all of the buildings areas. Ex situ treatment with sump removal is assumed for Bldg 7652. No further action is assumed for Bldg 7651, 7653, 7654, 7655, 7660, 7662.

RSA-193
THIOKOL IGNITER PREPARATION FACILITY

SITE DESCRIPTION

Building 7621 was constructed by Thiokol in 1957 as an igniter preparation facility. Currently, little is known about igniter preparation activities but may have included the following: wrapping wire, stripping insulation from wrapped wire pair, dipping wires in a conductive primer, and finishing the igniter by dipping them in a sealer. Igniter manufacturing activities included the following: degreasing; painting; stenciling; cleaning; and propellant handling. This building remained an igniter preparation facility until 1995.

Three auxiliary buildings were used to support igniter preparation at building 7621. Building 7622 (also built in 1957) was originally used as a boiler house. Sometime during the late 1970s to early 1980s, this facility became a storage facility and remained as such until 1995. Because Building 7622 was used as a boiler house, it is assumed that USTs or ASTs were located at or near this facility. It is documented that in the mid-1990s, a tank excavation took place north of Building 7622. Reportedly, a 6,000-gallon number-2 fuel oil tank and a 500-gallon propane tank were removed from the location. Buildings 7623 and 7624 were built in 1957 and were originally used as rest houses for igniter manufacturing operations. These buildings remained storage facilities until 1995.

A 30-inch diameter sump (RSA-135k) was located adjacent to the east site of the building. Building 7621 drainage lines reportedly flow to a leach field east of the building. This leach field area has been included in the site boundary for RSA-193.

In 2004, explosives and metals were detected in soils; perchlorate was detected in groundwater.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.6
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: PRO, PAHs, Explosives, Perchlorate, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-194
PHYSICAL TEST LABORATORY AND STORAGE FACILITIES

SITE DESCRIPTION

Building 7636 and 7637 were constructed in 1956 by Thiokol for use as a physical test laboratory (7636) and vacuum pump building (7637). Building 7636 remained a physical test lab until decommission in 1996. As a vacuum pump building, Building 7637 served as a "wet collector" for propellant dust generated in Building 7636. Building 7637 became a storage facility in support of Building 7636 operations during the late 1970s and early 1980s. From the early 1980s until 1996, Building 7637 was used as a mechanical equipment storage facility. For only a brief time during 1996, ammonium perchlorate was sieved for grinding operations in this facility.

Documentation suggests that operations at the physical test laboratory in Building 7636 may have included the following: degreasing, curing, motor or ingredient soaking, painting, and/or grinding. Three outbuildings (7637, 7638, and 7639) supported operations in Building 7636. Building 7638 was a second stage dry collection (filter system) location, but was also converted to a storage facility in the mid to late 1970s. Building 7639 is a small igloo that was used for storage of both propellants and explosives.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.4
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Perchlorate, VOCs, SVOCs, Metals, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

During a visit in 1996, numerous bays were noted in the north end of Building 7636 with a laboratory and office facilities on the south end. Trench drains located outside of the building lead to a captive sump (RSA-137h) at the northwest corner of the building. Reportedly, the propellant testing bays were washed out and wastewater would flow to the sump. The sump would then be pumped out and wastewater disposed of regularly. Another large sump was formerly located near the northeast corner of Building 7637. The sump had once drained to a culvert, but was no longer in tact. Approximately 120 quart-size boxes of propellant were located in Building 7639. Two storage pads were observed nearby to the east and southeast (one of which is designated as RSA-176). In 2004, perchlorate was detected in soil.

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-195
THIOKOL PROPELLANT MIX FACILITY #1

SITE DESCRIPTION

Building 7363 was constructed by Thiokol in 1959 to serve as a propellant mixing facility. From 1960 through the 1970s, the primary activity at this facility was mixing 300-gallon batches of propellant. The general procedure for propellant mixing at Thiokol was a stepped approach to make batches of 1.1 or 1.3 propellants at various quantities.

-Step 1 involved receiving the ground and dried oxidizer (ammonium perchlorate or HMX) and the other ancillary ingredients from other facilities where they were prepped and pre-mixed.
-Step 2 involved combining the binder, ammonium perchlorate or HMX, metal powder, stabilizers, curing agents, and burn rate modifiers in large mixers to a viscous slurry.
-Step 3 involved pouring the propellant slurry into casting cans.

1.1 and 1.3 propellants were mixed and then poured into casting cans at this facility. The greatest potential for release was related to the mixing process (i.e., overflow or spilling) and pouring of the propellant mixture from the mixers to the casting cans. It is possible, though undocumented, that the mixers were cleaned on-site. Building 7359 was the casting can cleanout and Building 7373 was the tooling clean-up, but there is no documentation of a separate mixer clean-up facility. Therefore, it is possible that solvents were used at this facility to clean propellants from the mixers once a batch was complete.

From 1980 to 1996, Building 7363 was used to mix aluminum paste. Aluminum was mixed with various polymers to a paste-like consistency for use as a fuel in rocket motors. Building 7363-B was built in the late-1980s to store aluminum powder.

One large mixer and a deaeration pit were located within Building 7363. Trench drains were visible running around the outside of the building to a captive sump (RSA-135c) located on the north side of the building. In addition, a temporary storage area (TSA) (RSA-136F) is located outside of the building. Reportedly, the TSA was used to store inert waste.

In 2004, a LSA indicated perchlorate was in the soil and TCE was in the soil and groundwater

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2.2
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, Metals, Perchlorate, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012

RC DATE: 201012

CLEANUP STRATEGY

A RI/FS is planned to delineate the extent of contamination. The data does not indicate a need for remedial action in soil at this time. The need for remedial action will be reevaluated when further data is available.

RSA-196
TEST STAND AND CLEANING BUILDING

SITE DESCRIPTION

Building 7373 was constructed by the Army in 1945 for use as a static test stand and parts cleaning facility. Finished rocket motors were mounted and fired to measure burn rate and efficiency of propellants. Building 7374 was the control bunker for testing operations. Currently, Building 7374 is located on the south side of Building 7373 as the buildings have been attached.

As a parts cleaning facility, propellant mixing and casting tools were brought to this location for cleaning. Cleaning was accomplished by using spatulas, hoes, and brushes to scrape off remaining propellant and then washing the tools with water. Over time, a high pressure spray method was developed that used a water-detergent-caustic solution that minimized exposure to personnel.

Following acquisition by Thiokol in 1985, the building was again used for parts cleaning. Parts were cleaned in a large tank using various solvents. It is documented that three 350-gallon TCE storage tanks (used in degreasing operations) were located on site.

A TSA (RSA-161) is located outside of the facility to the northeast.

In 2004, perchlorate was detected in soils.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, Metals, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-197
ROCKET MOTOR TEST STAND

SITE DESCRIPTION

Building 7375 (demolished) was constructed in 1942 by ROP for use as a static test stand. Thiokol used the facility (beginning in 1952) for ducted rocket testing and motor firings. Very few details were available regarding testing operations. During a 1996 visit to Building 7375, an 8-foot-diameter, 12-foot high concrete tank with an outlet to the ground was noted outside the building. In addition, three very large aboveground storage tank (AST) stands were located at the northeast corner of the building. Two hydrogen pumping stations were visible on the west and east sides of the building. The following chemicals are listed as having been used at Building 7375: Methyl alcohol; Methylene chloride; Miscellaneous oils, greases, and lubricants; 1,1,1-Trichloroethane; Trichloroethylene.

Building 7376 (demolished) was built in 1958 and was used as the control building for testing operations conducted at Building 7375. During a 1996 visit to this facility, barren soil was noted behind the building (to the south) and indicated the former storage of large items. In addition, trench drains were visible along the southern exterior of the building leading to a captive sump.

STATUS

SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 6.7
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Explosives, Perchlorate, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-198
THIOKOL EQUIPMENT/TOOL CLEANING FACILITY

SITE DESCRIPTION

Building 7359 was constructed by Thiokol in 1967 to serve as a casting can, bowl, and equipment cleanout. Cleaning of the casting cans was completed by spraying a hot water-detergent-caustic solution into the cans at high pressures. Through this method, the propellant was washed from the can and trapped and collected in a filtering basket located over an explosive-type industrial containment basin. Reportedly, the collected propellant wastes were emptied daily. Degreasing operations were also performed; therefore, solvents were also used to clean at this facility. It is documented that two solvent storage tanks were located on site, one 220-gallon tank and one 100-gallon tank.

Two TSAs, RSA-85 (formerly CCSMWU-085) and RSA-86 (formerly of the RCRA Program), are located adjacent to Building 7359 and will be addressed under this site. These TSAs were identified in the 1991 RFI and added to the 1998 RCRA Permit as SWMUs. These TSAs were used to store 1.3 propellant wastes and solvent wastes collected during cleanup activities. Each TSA originally consisted of a concrete pad with no runoff controls.

During the early 1990s, each TSA was converted to an enclosed building with containment sumps (RSA-138C and RSA-138D). A third TSA (RSA-138E) is located northwest of the building. All RSA-138C, D, and E (SWMUs identified in Permit) will be addressed under this site.

Some of the highest concentrations of perchlorate on the Arsenal were detected at RSA-85 and RSA-86.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2.5
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201106
RA(C)	201105	201106

RC DATE: 201106

CLEANUP STRATEGY

Additional RI/FS is planned. Sump/slab and additional soil removal is expected.

RSA-199
THIOKOL PROPELLANT MIX FACILITY #2

SITE DESCRIPTION

Building 7382 was constructed by Thiokol in 1959 to serve as a propellant mixing facility. From 1959 to 1996, the primary activity at this facility was mixing of 420-gallon batches of propellant. The general procedure for propellant mixing at Thiokol was a stepped approach to make batches of 1.1 or 1.3 propellants at various quantities.

-Step 1 involved receiving the ground and dried oxidizer (ammonium perchlorate or HMX) and the other ancillary ingredients from other facilities where they were prepped and pre-mixed.
-Step 2 involved combining the binder, ammonium perchlorate or HMX, metal powder, stabilizers, curing agents, and burn rate modifiers in large mixers to a viscous slurry.
-Step 3 involved pouring the propellant slurry into casting cans.

1.1 and 1.3 propellants were mixed and then poured into casting cans at this facility. The greatest potential for release was related to the mixing process (i.e., overflow or spilling) and pouring of the propellant mixture from the mixers to the casting cans. It is possible, though undocumented, that the mixers were cleaned on-site. Building 7359 was the casting can cleanout and Building 7373 was the tooling clean-up, but there is no documentation of a separate mixer clean-up facility. Therefore, it is possible that solvents were used at this facility to clean propellants from the mixers once a batch was complete.

A TSA (RSA-167) is located west of the building and reportedly stored 1.3 waste propellants/solvents.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.2
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, Metals, Perchlorate
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200804	201112

RC DATE: 201112

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-200
ROP LINE 5 AREA OPERATIONS FACILITIES

SITE DESCRIPTION

Buildings 7601, 7603, 7608 were constructed in 1943 as part of the ROP Line 5, which was originally used for 155 mm shell loading and assembly. After being acquired for use by Thiokol in 1950, 7601 and 7603 were used as a service facility for pilot line research operations and propellant mixing, respectively. Raw materials used in support of mixing and developmental operations were stored in 7608. From 1962 to 1982, Building 7603 was used as a laboratory to develop more efficient methods of production of rocket motors and propellant manufacturing. Activities in this facility would have included small scale grinding (HMX, RDX, and AP), mixing, casting, cleaning, degreasing, curing, sand/grit blasting, painting, assembly, and testing. Buildings 7603 and 7608 were demolished in 2001.

Building 7610 was constructed in 1944. Buildings 7602 and 7610 were the burster service magazines at Line 5. After being acquired for use by Thiokol in the early 1950s, both buildings were used as curing ovens. Historical records indicate that 7610 was also used for solvent storage until 1992.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 8
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, POL, Explosives, Metals, PCBs
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200701	200912
RD	200911	201002
RA(C)	201002	201102
RA(O)	201105	201602

RIP DATE: 201105
RC DATE: 201602

Building 7619 was constructed in 1943 for use by ROP as a paint storage building. Following acquisition by Thiokol in 1950, it served as a shop building and gas station. Based on building use, it is assumable that paints, solvents, and fuel were stored at this facility. An historical engineering drawing for this building was located that revealed the location of the former UST. The UST has been removed in 1998.

Building 7616 was constructed between 1950 and 1954, by Thiokol, for use as a maintenance services building. Miscellaneous carpentry and facilities activities were run operated out of this facility. A can of PCB containing ballasts were located in a room on the east side of the building. Miscellaneous electrical parts, shop equipment, 30-gallon drums of oil, and smaller containers of solvents were observed in a room on the east side of the building.

Building 7618 was built in 1958 and used by Thiokol in the 1960s and 1970s as a cleaning facility. It was most recently used for storage of janitorial supplies. Chemicals used included acetone, methylene chlorite and various propellants and solvents.

ROP LINE 5 AREA OPERATIONS FACILITIES

The PA/SI indicated high levels of Perchlorate in the soil and groundwater.

CLEANUP STRATEGY

Additional RI/FS is planned. NFA is expected at Bldg 7601, 7608, 7610, 7616, 7618, 7619. In situ soil treatment is expected at Bldg 7603 followed by 5 years of RA(O) and one 5 year review.

RSA-201
THIOKOL RESEARCH LABORATORY

SITE DESCRIPTION

Building 7632 was constructed by Thiokol in 1955 for use as a chemistry laboratory. While a number of laboratory experiments were conducted in the facility, operations in this facility also included propellant mixing and curing.

During a site visit, numerous pipe stubs were observed in the lab that were of unknown purpose. It appeared that a boiler was previously located in the basement which would suggest that USTs or ASTs were/are located at this facility. Various oil stains were present on the floor of the building.

Floor drains were also located within the laboratory. These floor drains appeared to drain to an exterior sump located on the west side of the building. Three 2 foot by 2 foot concrete sumps with no outlets were visible on the west side of the building just outside of the propellant mixing bays. Located to the south were three small storage sheds (containing drummed wastes), a larger wood storage shed, and multiple concrete pads. A few empty drums and a 20-pound propane tank was noted along the side of the building. The drummed wastes in the storage shed consisted of twelve 55-gallon drums of unknown contents, ten 30-gallon drums of waste propellant, and 25 smaller containers of materials such as acetone, PF degreaser, and aerosols.

Two temporary storage areas to the southeast are now being addressed as RCRA sites RSA-173 and RSA-174.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 3.3
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate, SVOCs, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	201104	201112

RC DATE: 201112

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-202
GRADED AREA NORTHWEST OF ROP STORAGE IGLOOS

SITE DESCRIPTION

RSA-202 is identifiable in aerial photographs from 1956 to 1964 as a graded area with a road leading to it. The nature of any activities in this area is unknown, but could have been used as a borrow area, disposal area, or burning ground. During the VSI, the primary features observed were debris piles, an elevated area, and drainage ditches. The uncertainties surrounding site use and data collected during the limited site assessment performed suggest the area requires further investigation.

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 15.9
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate, Metals, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	201104	201112

RC DATE: 201112

RSA-203
IGLOO AREA LOADING DOCK

SITE DESCRIPTION

Building 7351 was constructed in 1942 for use by the ROP as a shipping dock. Materials and munitions were shipped and received at this location enroute to/from storage in the igloo area.

Following acquisition by Thiokol in 1950, Building 7351 was used for packout of assembled rocket motors and as a shipping dock. Current building lists indicate that this building has most recently been used as a packout and shipping facility for assembled rocket motors. Activities would consist of receiving finished motors from the production lines, packing the rockets by palletizing and strapping, and loading the rocket motors onto rail cars or trucks for shipment.

During a 1996 visit, trench drains were observed in the truck loading area along the northern side of the building. Small storage pads (possibly former sheds) were located west of the building. One existing shed contained two drum racks that housed two empty drums and one sealed drum, all unlabeled. TCE is the only chemical listed as having been used in the building.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2.9
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate, Metals, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	201104	201112

RC DATE: 201112

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-204
THIOKOL OXIDIZER FACILITY

SITE DESCRIPTION

RSA-204 includes the Thiokol oxidizer facility located at the intersection of Eagle Road and Magazine Road in TA-10, which consisted of the following buildings:
- 7687: oxidizer service (storage) building
- 7688: class 1.1 nitramine (oxidizer) dying facility
- 7689: ammonium perchlorate grinding facility
- 7690: nitramine (HMX/RDX) grinding facility
- 7691: ammonium perchlorate processing facility

Oxidizer was received at the service facility and transported to the grinding and processing facilities, where they were screened and ground. The oxidizer passed through a screen and a magnetic separator immediately prior to entering a grinder or pulverizer to remove extraneous material. Dry oxidizers were ground to a very fine powder in impact-type mills. Dehumidifiers were used in the grinding facilities to enable the ground mixture to remain in a fine powder state. The powder was containerized and transported to nearby mixing facilities. Ammonium perchlorate, sodium chloride, HMX, RDX, isopropyl alcohol, and petroleum hydrocarbons are listed as having been used as part of these activities.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 8.5
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate, Metals, POL, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201106
RD	201105	201110
RA(C)	201110	201208
RA(O)	201208	201708

RIP DATE: 201208
RC DATE: 201708

During the visual site inspection, an east-west running trench drain was observed on the east side of 7690 that led east to an exterior captive sump (RSA-135m). Outside the east side of the building, a TSA labeled "AP/Inert Waste" that contained eight 30-gallon fiber drums (contents unknown) was observed. This TSA is recognized as RCRA site RSA-181. This site (CCSWMU-181) is NFA in the CC Program as of 2002. Floor drains were visible in the north end of 7691 leading to two exterior captive sumps (RSA-137k and RSA-137l). A waste storage bin labeled "AP/Inert Waste" and TSAs (RSA-138k and RSA-138l) were noted outside the building. There was some evidence of a small water treatment system located to the north of the building. The sumps and pads are still in place.

Results from the SI indicated elevated levels of Perchlorate in soil and groundwater and TCE in groundwater. Groundwater will be addressed as part of RSA-146.

CLEANUP STRATEGY

Additional RI/FS is planned. NFA is expected at Bldg 7687, 7688, 7690, 7691. Two ex situ treatments (7689 & northeast of 7691) and sump removal (7689) is expected. Five years of RA(O) with one 5 year review is anticipated after remedial action.

RSA-205
PHOTO LAB AND MOTOR SERVICE FACILITY

SITE DESCRIPTION

Building 7628 was constructed by Thiokol in 1957 for use as a change house and photographic laboratory. The change house was used by employees working in Building 7625 (motor production) and had change rooms, lunch facilities, and lavatories. The photographic laboratory supported testing operations and involved the use of X-rays to inspect finished rocket motors. Photographic chemicals such as developers, fixers, and toners were used, stored, and disposed at this building. This facility contained a floor drain and sinks that drained to the sewer. In 2004, POL was detected in soil and groundwater.

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.2
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: PRO, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200904	201112

RC DATE: 201112

RSA-206
PROPELLANT MIXING FACILITY #2 AND CASTING FACILITY

SITE DESCRIPTION

RSA-206 includes Buildings 7339 and 7340 that were part of the propellant plant located along Snake Pit Road. These buildings were constructed in 1960 for use by Thiokol as a mixer building and secondary casting and finishing facility for rocket motors, respectively.

The primary activity at 7339 was mixing of 420-gallon batches of class-1.3 propellant. The greatest potential for release was related to the mixing process (i.e., overflow or spilling) and pouring the propellant mixture from the mixers into the casting cans. Historical documentation for Building 7339 indicates that ammonium perchlorate was washed into the industrial drain with large quantities of water. The industrial drain then flowed to a sump (RSA-137a) that ultimately discharged to the sanitary sewer. A generator (with a possible UST) was located southeast of the building. Fill and vent pipes were present, but the exact location of any UST is unknown. A TSA (RSA-160) is located to the north of Building 7339. This TSA was reported to store class-1.3 propellant wastes. Recent building lists indicate that Building 7339 is as a research and development facility (metal fabrication). During a site visit, a generator was noted outside to the southeast. It is likely that a UST is associated with this generator because fill and vent pipes were observed on the ground surface. Exterior concrete trenches were noted to be draining to a sump (RSA-137a). This sump drains to the sanitary sewer.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME:
Industrial Discharge
SITE ACRES: 3.5
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
VOCs, Perchlorate, Explosives, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012

RC DATE: 201012

Activities at 7340 included casting propellants into rocket motors and finishing the motors by cutting off or removing excess propellant. Mixed propellants were received in casting cans. Casings were loaded with Teflon coated cores and then brought on racks to the casting area. Propellant was then poured into each casing using a vacuum method which aided in removing air from the propellant as the propellant was poured. Cast rocket motors were cured and finished. Finishing involved removing the core and cutting off any excess propellant.

Building 7340 contains a concrete sump (RSA-137b) with a metal separator along the northwest side of the building. The sump has a settling basin that collects particulate materials from class-1.3 propellant wastes and allowed liquids to drain to the sanitary sewer.

RSA-206
PROPELLANT MIXING FACILITY #2 AND CASTING FACILITY

TSAs (RSA-90 and RSA-138b) are visible outside the facility and were reportedly used for storage of class-1.3 propellant wastes and rocket motor insulation.

In 2004, VOCs and perchlorate were detected in soil and groundwater. The groundwater for this site will be addressed under site RSA-146.

CLEANUP STRATEGY

Additional RI/FS is planned. Current data indicates that remedial action may not be needed for soils.

RSA-207
ROHM & HAAS GORGAS LABORATORY

SITE DESCRIPTION

RSA-207, the Gorgas Laboratory, is located in Building 7770 and includes numerous surrounding facilities that have supported operations, such as: 7767, 7768, 7769, 7771, 7772, 7773, 7774, 7775, 7776, 7777, 7778, 7779, and 7780.

Building 7770 was constructed by Rohm and Haas in 1951 for use as a propellant research and development laboratory. Propellants were modified and tested to improve mixtures and develop new propellants. Any of the following operations may have taken place at this facility (in small quantities): screening, grinding, mixing, casting, curing, and finishing. Various wastes were reportedly produced in small quantities, and waste disposal was reportedly well controlled. The only water used in cleaning and decontamination was for washing floors and equipment. Wash water reportedly flowed through sand filters into floor sumps, where solids were removed prior to discharge into drainage ditches. Solvents and solid wastes were routinely collected in hazardous-waste containers and desensitized prior to disposal. Reportedly, there was a 5,000-gallon fuel tank at this building for heating purposes (location unknown).

Support facilities included storage magazines/buildings, oven shelters, and heater houses.

This site is in an active range.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 6
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, Perchlorate, PRO, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012

RC DATE: 201012

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-208
SOUTH PLANT TESTING FACILITIES

SITE DESCRIPTION

RSA-208, the South Plant Testing Facilities, includes the following buildings/operations:

Building 7550 consists of two former firing stands. This facility was constructed in 1942 for use by the Army to test bazooka rockets. Reportedly, a liquid test stand used hydrazine, inhibited red fuming nitric acid, nitric acid oxidizer, and dinitrogen tetroxide.

Building 7565 was constructed in 1945 for use by the ROP as a paint house for Line 3 munitions. However, use of the facility was brief because all war-related operations were halted in 1946. It is assumed that operations in this building included cleaning with solvents. In 1950, Rohm and Haas converted the facility into a control building and static test stand (on the south end). Rocket motors were mounted on stands and fired. A darkroom was also present for processing photographs of testing operations. It is assumed that various chemicals related to photograph development were used at this site. At the time that Building 7565 was being converted into a static test stand and control facility, an acceleration range was constructed just west of the facility. The acceleration range was attached to Building 7565 via an underground tunnel and was used to test shoulder-fired rockets. The static test stand and acceleration range were collectively referred to as the E-Range by Rohm and Haas employees.

Building 7569 was constructed in 1945 for use by the ROP as a remelt building for munitions operations on Line 3. Modifications were made to the facility by Rohm and Haas in 1956 to support rocket weapons testing. From 1956 to 1971, Rohm and Haas performed thousands of static test operations in the bunker area south of Building 7569. Raytheon used the facility for guided missile maintenance from 1977 to 1982. From 1985 to 1993, Thiokol used Building 7569 for storage of Tube-Launched, Optically-Aimed, Wire Guided (TOW), and Hellfire missile casings. Reportedly, during the early years, an oil-burning heater supplied heat to the facility and a 250-gallon heat oil tank was stored on site to fuel the burner. Documentation suggests that the tank was removed in 1956.

Building 7587 was constructed in 1962 by Rohm and Haas for use as a static test stand. Rockets were mounted and fired from this facility while instrumentation mounted on the north side of the building recorded measurements.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 3.3
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate, PRO, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Surface Water, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012

RC DATE: 201012

CLEANUP STRATEGY

Additional RI is planned. NFA is expected.

RSA-209
PROPELLANT CRUSHING/GRINDING AND FUSE PRODUCTION

SITE DESCRIPTION

Constructed in 1955, Building 7568 was used by Rohm and Haas as an ammonium perchlorate and potassium perchlorate crushing and grinding facility until 1971. Grinding operations included receiving/storing raw materials and processing them through a hopper into large mills to grind the oxidizer into powder. Cleaning of the grinding machinery may also have taken place on the premises. Vacuums were typically used during grinding to mitigate dust. The western side of the building had seven bays that were used for grinding, analytical laboratories, ovens for removing solvent from nitroglycerin, instrumentation, and storage. The southeastern corner of the building contained X-ray facilities, a photographic laboratory, an analytical laboratory, and an air conditioning room. The northeast corner of the building contained offices and two storage bays. The Army regained control of the facility in 1971, and its use is undocumented until 1975. From 1975 to 1982, Raytheon used the facility for unknown use in Dragon Missile production. Recent building lists indicate that this facility was used for fuse production in the early 1990s.

In 2004, perchlorate was detected in the groundwater.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.6
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOC, Perchlorate, Explosives, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201106

RC DATE: 201106

CLEANUP STRATEGY

Additional RI/FS is planned. Current data indicates that remedial action may not be needed for soils.

RSA-210
NITROGLYCERINE WASH HOUSE

SITE DESCRIPTION

Building 7559 was constructed between 1950 and 1956 for use by the Army as a nitroglycerine wash house. Nitroglycerine washing is a process of removing acids from nitroglycerine by subjecting the compound to warm water and an alkaline solution. Subsequently, this facility was used as a heat treatment facility. Available historical documentation provides little information regarding heat treatment operations. Thiokol did not use this building, as it was demolished by the 1970s.

CLEANUP STRATEGY

Additional RI is planned. NFA is expected.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Perchlorate, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012

RC DATE: 201012

RSA-211
SOUTH PLANT STORAGE MAGAZINES

SITE DESCRIPTION

The South Plant service magazines were constructed in 1953 to support Army activities in the area. These facilities include Buildings 7533 through 7539. Available historical documentation provides little information regarding materials stored in these magazines or the activities they supported.

The nitroglycerine magazines occupy Buildings 7529 through 7531. These buildings are storage igloos with earthen mounds covering their south, east, and west sides. Available historical documentation provides little information regarding activities at these facilities. It is assumed that they were used to support research and development operations in the South Plant area. During 1993 or 1994, an incident occurred which required overpacking a drum of red fuming nitric acid. Building 7532 was reportedly the (electric) heater house for the nitroglycerine storage magazines.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 10
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Perchlorate, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012

RC DATE: 201012

The propellant magazines were constructed between 1950 and 1956 to support Army research and development activities in the South Plant area. This area includes Buildings 7523 and 7525, which were constructed in 1985 for use by Thiokol to store nitramine and ammonium perchlorate. By 1976, only Buildings 7527, 7528, and 7529 remained. By 2000, the remaining facilities were used for oxidizer storage. Ammonium perchlorate, HMX, and RDX are listed as having been stored in Buildings 7523, 7524, and 7525. It is assumed that the other buildings in this PSA stored similar materials.

The area occupied by Building 7524 was originally part of the propellant storage magazine facility. The current building was constructed in 1985 for use by Thiokol as a storage facility for nitramines and ammonium perchlorate. Materials were stored in this facility until needed for drying at Building 7522 or grinding at Building 7521. Available historical documentation provides little information regarding storage practices (handling, duration, etc.). The following chemicals are listed as having been potentially stored in Building 7524: ammonium perchlorate; HMX; and RDX.

CLEANUP STRATEGY

Additional RI is planned. NFA is expected.

RSA-212
PROPELLANT DRY HOUSES

SITE DESCRIPTION

Buildings 7590 (north) and 7591 (south) were constructed by the Army in1951 for propellant drying. These facilities were powered by Building 7589, an electric boiler house. Heaters and ovens were kept in the buildings, which were operated by an operations contractor until 1958. Rohm and Haas used the facilities from 1958 to 1971. RSA regained control of the facilities in 1971 and used them for unknown purposes until 1976. Buildings 7590 and 7591 were used by Raytheon to store flammable materials from 1976 to 1982, when they were abandoned.

During a 1996 visit, the buildings were observed to be in disrepair, with stained floors, peeling paint, and debris scattered throughout. Oven doors in Building 7591 were labeled "Oxide and Explosive Storage".

The 2000 aerial photograph documents the recent storage of munitions within this site. The munitions appear for the first time in the 2000 aerial photograph but are not present in the 1992 photograph. For the purposes of this investigation, including sampling associated with the LSA, the focus is on Buildings 7590 and 7591, which were historically used for propellant drying and flammable-materials storage. Presumably, historical activities at these buildings were more likely to have been sources of contamination than the finished munitions being stored in the area during the recent past.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 0.8
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Perchlorate, Explosives, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012

RC DATE: 201012

CLEANUP STRATEGY

Additional RI is planned. NFA is expected.

RSA-213
ROP LINE 4 AREA OPERATIONS FACILITIES

SITE DESCRIPTION

During ROP operations (1942-1945), both a Chemical Ammunition Assembly Line and a Munitions Renovation Line were operated as Line 4 within RSA-213. In general, all major components, such as cartridge cases and empty shells, came from manufacturers throughout the country. Components such as fuses, boosters, propellant charges, and primers were produced at other ordnance works or plants and shipped to Redstone as free issue. Redstone manufactured the chemical component of the ammunition and the burster charge. The ROP was responsible for assembling the completed rounds on Line 4.

Subsequent to ROP operations, which ceased in 1945, Rohm and Haas gradually modified and expanded Line 4 to facilitate propellant development and testing. By 1957, Line 4 consisted primarily of propellant research and development operations. Operations may have included small-scale oxidizer grinding and drying, propellant mixing, casting, and finishing, motor assembly, and core and liner preparation (including degreasing and painting). Cast propellants were treated in the heat treating facility. An X-ray facility was used to evaluate propellants produced by various casting and pouring operations. The facility also included an inert storage facility for nearby research and development activities.

Raytheon and Thiokol used several of the facilities in the area subsequent to Rohm and Haas occupation, which ended in the early 1970s. Raytheon used the facilities to support development of the Dragon Missile. Thiokol used several facilities for propellant and rocket motor production as part of the RARE South Plant, which was active from 1950 to 1996.

Buildings included in these operations include: 7571, 7574, 7578, 7585, 7575, 7581, and 7549.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 15.3
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, Perchlorate, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201106
RD	201105	201110
RA(C)	201110	201208
RA(O)	201204	204108

RIP DATE: 201208
RC DATE: 204108

CLEANUP STRATEGY

Additional RI/FS is planned. Since the groundwater contamination appears to be isolated, the MNA will be funded under this site instead of the GW Unit. LUCs funded under RA(O) are anticipated.

RSA-214
ROP LINE 6 AREA OPERATIONS FACILITIES

SITE DESCRIPTION

The Army built Buildings 8971, 8972, and 8973 in 1945 as assembly and packing facilities in support of renovation operations on Line 6. Renovation of complete rounds involved five principal steps: unpacking and inspection; disassembly and removal of defective components; repair or replacement of defective components; reassembly of the rounds; and repacking. The level of renovation varied with each lot of ammunition. Some items required repair or replacement of components; others required only inspection and replacement of packing materials.

By 1968, these buildings were listed as laboratories and shops. Available historical documentation provides little information regarding specific operations or activities with regard to these operations.

In 2004, TCE was detected in the groundwater and soil.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 11.2
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, Metals, Explosives
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	201001	201212

RC DATE: 201212

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-215
RSA-146 HISTORIC SERVICE FACILITIES

SITE DESCRIPTION

RSA-215 includes various historical service facilities. The site includes the flowing buildings:

- 7103 (1942) machine shop to support general maintenance, currently designated as a laboratory and storage facility
- 7104 (1943) carpenter shop and change house, currently designated as a post engineer and welding shop
- 7106 (1945) motor pool wash and grease rack
- 7119 (1943) generating station and machine shop
- 7141 (between 1943 and 1950) oil storage
- 7107 (1942) gas station
- 7140 (1942) maintenance field office, subsequently used as a taxi dispatch station and paint storage shed in support of motor pool activities.

Available historical documentation provides little information regarding these operations. During the 2003 VSI, primary features observed were concrete pads, flammable materials storage areas, a subterranean pit in the interior floor of 7104, old and new electrical transformers, and areas of slag and metallic debris. In 7106, the primary features observed were a sump, cracked pavement, a former gas pump/UST area, and surface drainage channels. Two historical drawings (1984 and 1991) were reviewed which showed the location of two former 2,000-gallon underground gasoline storage tanks (the USTs are still in place).

In 2004, high levels of pesticides were detected in the soil.

TCE and other contaminants in groundwater will be addressed under RSA-146.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 17.5
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, PRO, Metals, PCBs, Pesticides
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201106
RD	201105	201110
RA(C)	201110	201208
RA(O)	201208	204208

RIP DATE: 201208
RC DATE: 204208

CLEANUP STRATEGY

Additional RI/FS is planned. Soil removal is expected for the pesticide contamination.

Five years of RA(O) followed by one 5 year review are anticipated. Thirty years MNA are anticipated.

RSA-217
INERT STORAGE WAREHOUSE FACILITIES

SITE DESCRIPTION

The Inert Storage Warehouse Area was built by the Army in 1942 and includes the following facilities:

Bldg 7417 - The ammunition division stored inert munitions components and shipping supplies in these warehouses until needed on the assembly or manufacturing lines. Since 1957, Building 7417 has been listed as a warehouse reclamation shop. Available historical documentation provides little information regarding reclamation operations.

Bldg 7437 - The ammunition division stored inert munitions components and shipping supplies in these warehouses until needed on the assembly or manufacturing lines. In 1957, Building 7437 was listed as a laboratory and engineering building. The facility was used to house engineering management space for the laboratory chief. During this time frame, Building 7437 contained a data reduction center. By 1968, Building 7437 had been converted to an administrative building. Current building lists indicate that use of the facility has not changed since 1968.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-12
GW SITE #: RSA-146
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 4.6
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, PRO, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	201001	201306
RD	201305	201310
RA(C)	201310	201408
RA(O)	201408	204308

RIP DATE: 201408
RC DATE: 204308

Bldg 7441 - The ammunition division stored inert munitions components and shipping supplies in these warehouses until needed on the assembly or manufacturing lines. This building was subsequently used as a photographic laboratory when it was joined to Building 7442 in 1959. Available historical documentation provides little information regarding laboratory and engineering operations.

Bldg 7442 - The building was used first in 1943 and subsequently as an office, a photographic laboratory, and a laboratory. Very little is known about the activities that took place or the materials that were used in this building.

Bldg 7421 - The building was subsequently used as a laboratory. Available historical documentation provides little information regarding laboratory operations. Current building lists indicate that use of these facilities has not changed over time.

Bldg 7425 - The building was subsequently used as an administrative facility where a small boiler with a 1,500-gallon fuel oil tank was used to heat the area.

RSA-217
INERT STORAGE WAREHOUSE FACILITIES

Available historical documentation provides little information regarding the location and type (UST/AST) of fuel oil tank at the building. Current building lists indicate that use of these facilities has not changed over time.

CLEANUP STRATEGY

Additional RI/FS is planned. Soil excavation is expected at Bldg 7417 and 7437. Since the groundwater contamination appears to be isolated, the MNA will be funded under this site instead of the GW Unit.

RSA-218
DRMO OPEN STORAGE AREA

SITE DESCRIPTION

This area is identifiable as an open storage area on aerial photographs as early as 1943. The Defense Reutilization Material Office (DRMO) managed open storage of materials in this area. Aerial photography shows activity continuing until at least 2002 (within the fenced area). Portions of the area are represented on the 1975 Basic Information Maps as "Open Storage". During the 2003 VSI, the primary features observed were piles of scrap metal, a large concrete slab, and two large areas of debris.

CLEANUP STRATEGY

Additional RI/FS is planned. Debris and soil removal is expected.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-12
GW SITE #: RSA-146
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 27
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112
RD	201111	201204
RA(C)	201204	201302

RC DATE: 201302

RSA-219
CHEMICAL STORAGE AREA IN SALVAGE YARD

SITE DESCRIPTION

Surface storage of various materials is documented to have occurred within this area. Aerial photography shows activity from 1950 until at least 2000. It is unknown what materials were stored in the area. This area is represented on the 1975 Building Information Maps as an "Open Storage" area. During the 2003 VSI, the primary features observed were the reported location of a former chemical storage barn and an area of scrap metal. Salvage yard personnel stated that the area was used to store drums of solvents (e.g., TCE) associated with Thiokol in the mid 1980s. It was reported that some of the drums had leaked.

This site is still being used as a scrap metal storage. The IRP will only address the VOC contamination from the old chemical storage, the metals contamination will be address with non-IRP funds.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-12
GW SITE #: RSA-146
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 3
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201206
RD	201205	201210
RA(C)	201210	201308
RA(O)	201308	204208

RIP DATE: 201308
RC DATE: 204208

CLEANUP STRATEGY

Additional RI/FS is planned. Since the groundwater contamination appears to be isolated, the MNA will be funded under this site instead of the GW Unit. LUCs funded under RA(O) are anticipated.

RSA-220
CONSTRUCTION MATERIAL STORAGE YARD

SITE DESCRIPTION

The construction materials yard is identifiable on aerial photographs as early as 1956. Open storage of various construction debris and surplus is documented to have occurred on the surface in the area. Aerial photography shows activity continuing until at least 2002 (within the fenced area). Subsurface disposal via debris mounds may have occurred. The 1975 Building Information Maps label the area as the "Contractor's Construction Materials Yard". Part of this site is in an active range. During the 2003 VSI, the primary features observed were a concrete pad, two debris piles, a large railroad loading dock, and a drum.

CLEANUP STRATEGY

Additional RI/FS is planned. LUC is expected.

Five 5-year reviews are planned. One 5-year review and the first 5 years of LUC are planned as RA(O). The remaining four 5-year reviews and LUCs are included in the LTM estimate.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-12
GW SITE #: RSA-146
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 8.3
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	201001	201212
RA(C)	201212	201306
RA(O)	201306	201806
LTM	201806	204306

RIP DATE: 201306
RC DATE: 201806

RSA-223
CENTRAL RAILROAD CLASSIFICATION YARD

SITE DESCRIPTION

RSA-223 is the site of the former Nashville, Chattanooga & St. Louis (NC & STL) Railroad Classification Yard which is located just north of the Sparkman Center and Martin Road, west of Patton Road and east of Burose Road. The classification yard was completed in approximately November 1941 and had seven tracks with a 116-car capacity. Materials/items classified in the rail yard have not been completely determined, although historical documentation does list expendable items such as chemicals, salt, coal, fuel oil, and miscellaneous supplies as the primary inbound items. Outbound items consisted of containers of goop (an incendiary material composed of gasoline, magnesium particles, and asphalt), ton containers of various contents (mustard, lewisite, and phosgene), scrap iron, lumber, and miscellaneous supplies that were stored and potentially shipped by rail from this area.

The installation railway system was discontinued in July 1973 and was approved for removal at that time. The tracks composing the classification yard were not observed in a 1983 aerial photograph.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: MY
TYPE NAME: Maintenance Yard
SITE ACRES: 14.7
RRSE RATING: High
OE: No
CONTAMINANTS OF CONCERN:
PRO, SVOCs (PAHs), Metals
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	200311	200405
SI	200405	200909
LTM	200909	203909

RC DATE: 200909

An east-west trending natural surface drainage feature is located immediately south and southeast of the classification yard. This feature originally passed under Patton Road via a culvert north of Martin Road, discharging into the wetlands to the east. A feeder tributary trending north-south intersects the main feature due south of where the multiple track classification yard begins. An apparent man-made channel directly from the classification yard to the drainage feature is distinguishable on a 1956 aerial photograph. Historically, this feature received surface runoff from the classification yard and has therefore been included in the conceptual site model for the site.

A PBC has been awarded for SI through remedy in place followed by 5 years of RA(O) and a 5 year review.

CLEANUP STRATEGY

A PBC will address this site from SI through remedy in place followed by 5 years of RA(O) and a 5 year review. A SI will be initiated and will act as the RI/FS to characterize and delineate metals and petroleum-related contamination. LUCs are the anticipated remedy. LUCs and 5 year reviews are expected to continue indefinitely.

RSA-224
CONTAINER STORAGE AREA

SITE DESCRIPTION

RSA-224 consists of the Former Ton Container and 55-Gallon Drum Storage Area which is located south of the quarry at Madkin Mountain. A historical photograph, dated February 1947, shows stacked "Type D" and "Type E" ton containers, along with 55-gallon drums, being staged in the vicinity of former railroad spurs 7 and 8 of track 85B RR1. This location appears west of the former railroad classification yard (RSA-223) with Madkin Mountain visible in the background. Chemical agent, Mustard and Lewisite, was stored and shipped in ton containers. Drums containing "Goop", an incendiary mixture containing magnesium particles and asphalt, were staged to the south in the area of the current Sparkman Center as documented in the 1947 photograph. An exact location of this storage area has not been determined from this and other photographs. However, the general vicinity is the area north of the newly constructed Wernher Von Braun Complex based on the relationship to the quarry and rail spur.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 14
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: PRO, SVOCs (PAHs), VOCs, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200402	200405
SI	200406	201012
LTM	201012	203512

RC DATE: 201012

In FY04, a LSA indicated a SI was needed to delineate POL and SVOCs at the site.

A PBC has been awarded for SI through remedy in place followed by 5 years of RA(O) and a 5 year review.

CLEANUP STRATEGY

A PBC will address this site from SI through remedy in place followed by 5 years of RA(O) and a 5 year review.

An expanded SI will be initiated and will act as the RI/FS to confirm the presence of suspected contamination over this 14 acre site. It is anticipated LUCs will be the remedy. LUCs and 5 year reviews are anticipated to continue indefinitely.

This site is the future location of the Southern By-Pass.

RSA-225

FUSE MODIFICATION LINE 7 (PAGE 1 OF 2)

SITE DESCRIPTION

Building 5429 and former Buildings 5478 and 5479 are/were located on Jungerman Road, one block south of its intersection with Fowler Road. Building 5429 (formerly 729) was constructed in 1942 as a general warehouse with railroad access by RR 20 spur No. 6. Engineering drawings, dated 1950, and other documentation, dated 1951, indicate that Building 5429 was converted to the No. 7 fuse modification line and became active in the late 1950s, probably in support of the Korean War. The type of fuses undergoing modification has not been determined. However, it was noted in historical documentation that Calabama Chemical Corporation had requested to lease two buildings (722/5438 and 726/5426) near Building 5429. This request was denied because the buildings were located within the "quantity-distance safety zone" for the No. 7 fuse modification line indicating the operation included materials with the potential for explosion.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2.4
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs. Metals, Nitrocellulose
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200402	200405
SI	200405	200501
RI/FS	201001	201212
RD	201211	201304
RA(C)	201304	201402

RC DATE: 201402

The 1954 building utilization list associates the following five (5) buildings with Building 5429 activities: Building 721 (change house/lockers), Building 5477 (magazine), Building 5478 (729B) (paint house), Building 5479 (magazine), and Building 730 (lunch room). Engineering drawings detail additions of a loading ramp and dock connected to the southeast end of Building 5429. Additional modifications to Buildings 5429, 5477, and 5479 were documented on the 1954 building utilization map and a 1956 aerial photograph. These two references showed connecting ramps constructed among the three buildings, to support the fuse modification activities.

A 1957 engineering drawing details the modification of the connecting ramps between 5479 and 5477 (attached to Building 5429 by a walkway) to that of an infrared dark tunnel to support research in guidance and control. Other modifications to Building 5429 are documented on a 1965 engineering drawing that shows ventilation for liquid hydrogen to support a recording spectrophotometer, formerly located in a laboratory in the southern one-half of the building. The intended material(s) for spectrophotometric analyses are currently unknown.

Sampling to date has indicated the points of concern for the Fuse Modification process to be centered around Buildings 5429, 5478 (paint house), and 5479 (magazine).

FUSE MODIFICATION LINE 7 (PAGE 2 OF 2)

Part of this area is still used as a satellite accumulation area. The IRP site will only address the explosives contamination from the former use.

CLEANUP STRATEGY

Based on the results of the LSA, an expanded SI will be initiated to confirm the presence of suspected contamination at this site. A limited soil removal is expected.

RSA-226
OPEN STORAGE 54-2

SITE DESCRIPTION

RSA-226 has been defined as the storage area outside Building 5488. Building 5488 is located north of the intersection of Mills Rd. and Stewart Rd. Documentation indicates that chemicals (unknown or unidentified) were stored in the area as well as other electrical items including transformer storage (1.5 to 150 kilovolt-ampere capacities). The outside storage area is opposite the former rail spur that serviced the southwest side of Building 5488. Review of the 1943, 1950, and 1964 aerial photographs indicated that there was activity (presumably continuous) at the storage area during this time frame. Documentation of building use from 1961 indicated that the building was occupied by three separate occupants: field service, industrial operations, and a central office. Because transformer storage was documented at the "open storage 54-2" (and possibly in the warehouse), it is possible that a release of dielectric fluid (transformer oil) may have occurred.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 1.1
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
Pesticides, PCBs
MEDIA OF CONCERN:
Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200402	200405
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

Results of the VSI indicate that the storage area is still in use. Chemically treated poles are currently being stored in the area. The presence of PCBs and technical chlordane in groundwater resulted in the storage area being made a site, realizing that additional data is needed to understand the source of the pesticide. There is no current documentation indicating that pesticides would be expected at the site. The technical chlordane concentrations were detected and reported by the laboratory during the PCB analysis as an interference. The source of this contaminant needs to be investigated. Since the site is still in use, the investigation for this site should be focused on the technical chlordane and PCB issues only.

CLEANUP STRATEGY

An RI is planned. NFA is anticipated.

RSA-227
INACTIVE WASHRACK

SITE DESCRIPTION

RSA-227 is an inactive washrack adjacent to Building 5492 just north of Mills Rd. in the maintenance shop complex (Buildings 5494/5495). The VSI confirmed the presence of the washrack and sump located on the south side of the building. Documentation as to the date of construction or specifying years of use have not been found; however, interviews with site personnel suggest the washrack has not been used since before 1984. Subsequent to this use the area was used as a parking area for maintenance equipment. Based on the limited information available, the estimated period of operation is believed to be from 1962 to 1984. There does not appear to be an oil/water separator connected to the inactive washrack. The sump discharges to the south to a surface drainage feature.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: RW
TYPE NAME: Washrack
SITE ACRES: 0.04
RRSE RATING: Low
OE: No
CONTAMINANTSOF CONCERN: VOCs, SVOCs, PRO, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment, Surface Water, Groundwater

Phases	Start	End
PA	200402	200405
SI	200405	200501
RI/FS	200901	201206
RA(C)	201205	201206

RC DATE: 201206

CLEANUP STRATEGY

Additional RI/FS is planned. Sump and soil/sediment removal is expected.

TCE in groundwater will be addressed under RSA-147 and is coming from a different location.

RSA-228
SEWAGE TREATMENT PLANT 2

SITE DESCRIPTION

The Sewage Treat Plant 2, Building 139 (later renumbered 3239) is located west of Patton Rd., west of McDonald Creek, and just south of Goss Rd. (3200 block area). The plant was believed to be operational by 1942 and was taken out of service in 1948. A 1943 Army Completion Report for Huntsville Arsenal stated that the plant serviced the northern portion of the arsenal including the Administration Area (former hospital, base housing, etc.) and the Temporary Administration Area (maintenance shop, washrack/garage, fire/police station, steam plant, and carpenter shop). Wastes from Plant Area #3 were not directed through this STP but were sent through Building 439 (RSA-9). Domestic sewage effluents received primary and secondary treatment through this plant before being discharged to the stream.

The plant used a separate sludge digestion and recirculating biofiltration units. The plant units included barscreens, primary clarifiers, biofilters, secondary clarifiers, recirculating pumps, chlorinators, chlorine contact chamber, sludge pumps, sludge digestion tanks, and open sludge drying beds.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-1
GW SITE #: RSA-145
TYPE CODE: ST
TYPE NAME: Sewage Treatment Plant
SITE ACRES: 5.2
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200311	200405
SI	200405	200506
RI/FS	201001	201212
RD	201211	201304
RA(C)	201304	201402

RC DATE: 201402

VSI confirmed the STP has been demolished and that most of the equipment has been removed. Remains of two of the clarifiers are present. An engineering drawing was used to georeference the probable location of the sludge drying beds. The area is fenced and heavily wooded. The discharge location (outfall) was not located, but an east-west drainage ditch flows into McDonald Creek.

CLEANUP STRATEGY

Additional RI/FS is planned. Removal of the two sludge-drying beds is expected.

RSA-229
FORMER PX SERVICE STATION

SITE DESCRIPTION

The PX Service Station, Building 197 (later renumbered 3197) is located on Arsenal property near Gate 8 and north of Goss Rd. The building is first seen on a 1954 building map. Engineering drawings revealed the presence of a septic tank connected to floor drains in the lift bays, as well as two 10,000-gallon underground storage tanks. No documentation was found regarding any spills or leaks from the gas station. It is not know if the USTs are in place.

The building still exists but has been converted to offices and storage space. TPH, as gasoline, and BTEX have been detected in groundwater.

The site will be addressed using the ARBCA program.

A PBC has been awarded for INV through remedy in place followed by 5 years of IMP(O) and a 5 year review.

CLEANUP STRATEGY

A PBC has been awarded for INV through remedy in place followed by 5 years of IMP(O) and a 5 year review.

STATUS

REGULATORY DRIVER: RCRA, Subtitle I
SURFACE OU: OU-1
GW SITE #: RSA-145
TYPE CODE: TU
TYPE NAME: Underground Storage Tank
SITE ACRES: 0.7
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, PRO, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
ISC	200311	200506
INV	200509	200911
CAP	200509	201106
DES	200509	201110
IMP(C)	200509	201208
IMP(O)	200509	202208
LTM	202208	202708

RIP DATE: 201208
RC DATE: 202208

An investigation will be initiated to characterize and delineate petroleum-related contamination. It is anticipated that a corrective action implementing soil removal, ORC injection at the hot spots and groundwater monitoring will be performed based on the results of the ARBCA Tier II report.

IMP(O) may include groundwater monitoring for MNA for 10 years and a 5 year review followed by 5 years of monitoring in LTM.

RSA-230
ABANDONED RUBBLE PILE

SITE DESCRIPTION

The abandoned rubble pile north of Hansen Rd. was the original construction and debris disposal area for the Arsenal. It is located just north of Hansen Rd near the bend in the road. It is believed that this disposal area was active during the 1940s. It is not known when disposal was discontinued.

During the VSI, a number of soil mounds with metal debris, rusted drums, railroad ties, etc. were visible above grade. A nearby ditch also appears to have been used for disposal activities. This area was used for field training exercises from the 1960s through the 1990s. It is currently an active range for OMEMS field troop training. Posting in the area indicates the presence of MEC presumably from the OMEMS training activities.

The results of the SI indicate pesticides, nitrocellulose and metals at low levels.

CLEANUP STRATEGY

Based on the results of the LSA, a RI will be initiated to confirm the presence of suspected contamination at this site. LUCs due to MEC are expected.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-1
GW SITE #: RSA-145
TYPE CODE: AA
TYPE NAME: Surface Disposal Area
SITE ACRES: 4.3
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Pesticides, Nitroaromatics, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200311	200405
SI	200405	200506
RI/FS	200901	201112
RA(C)	201112	201206
RA(O)	201206	201706
LTM	201706	204206

RIP DATE: 201206
RC DATE: 201706

RSA-231

SMF #1 MIXING & PREP FACILITIES

SITE DESCRIPTION

RSA-231 is comprised of the Smoke Munitions Filling (SMF) #1 Mixing and Prep Facilities. The buildings included in these operations are as follows:

Building 675/3475, starter tube assembly building, was built in 1942 and supported the manufacture of a number of smoke munitions within SMF#1 in the early to mid-1940's. This building was designed and used as a starter tube assembly building for the 105mm M-1 canister. This building was also used to assemble the impregnated sleeve over the starter tube in the production of various smoke canisters (M-1, M-2). Two cubicles on the south end of the building were used to prepare delay train pellets wafers used in the manufacture of the M-88 and M-89 smoke shells. Scratcher mix was applied to the band for the M-1 smoke pot in this building. The building was demolished in 1983 and building 3483 was built in its place.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-1
GW SITE #: RSA-145
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 2.9
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, PRO, Nitroaromatics, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	200311	200405
SI	200405	200506
RI/FS	201001	201212

RC DATE: 201212

Building 678/3478, black powder mixing building, was built in 1943 and used for black powder mixing for various smoke munitions. Wet mixing of the impregnated sleeve mixture was also performed in this building for the 155mm M-4 and M-4 canisters. Building 3478 is currently being used for storage.

Building 674/3474, starter mix building, was built in 1943 and used for blender mixing of starter mix, match head mix (may have contained small quantities of perchlorate), and scratcher mix for M-1 smoke pots. Blending of the starter mix for the 105mm M-1 and M-2 canisters, British Thermal Mixture, sulfurless meal powder mixture, and impregnated sleeve mixture for the 155mm M-3 and M-4 canisters was performed in Bldg 3474. Most of this building has been rebuilt and is currently being used as a fitness center.

Buildings 667/3490 and 667-2/3491, mixing and blending buildings, were built in 1943 and used for mixing and blending of hexachloroethane (HC) smoke mixtures for the AN-M8 hand grenades, the M-1 smoke pots, and the M-88 and M-89 smoke shells. Building 3490 has been demolished while 3491 is currently still standing but unused at this time.

Building 679/3479, sleeve impregnating building, was built in 1943 and used for the impregnation of starter sleeves for the 105mm M-1 canisters as well as the 155mm M-3 and M-4 canisters. Match head mix (may have used small quantities of perchlorate) was applied to discs and dried for use in M-1 smoke pots in this building.

SMF #1 MIXING & PREP FACILITIES

The drying of delay train pellets (starter wafers) for M-88 and M-89 smoke shells was also done here. The building has been used as a restaurant/cafeteria and is currently used as a barber shop, a military clothing store, and human resources office.

CLEANUP STRATEGY

Further investigation is planned. NFA is expected.

RSA-232
SMF #1 SERVICE STATION

SITE DESCRIPTION

Building 655 was a gasoline service station in the 1940s. It was located just west of Building 3452, Garage and Tool House. It supported the SMF#1 during its operation. It is not known when the building was demolished or whether or not the USTs have been removed.

The site will be addressed through the ARBCA program.

Direct push sample locations rendered no groundwater for chemical analysis during the limited site assessment.

CLEANUP STRATEGY

A PBC has been awarded for INV through remedy in place followed by 5 years of IMP(O) and a 5 year review.

An investigation will be initiated to characterize and delineate petroleum-related contamination. It is anticipated that a corrective action implementing soil removal will be performed based on the results of the ARBCA Tier I report.

STATUS

REGULATORY DRIVER: RCRA, Subtitle I
SURFACE OU: OU-1
GW SITE #: RSA-145
TYPE CODE: TU
TYPE NAME: Underground Storage Tank
SITE ACRES: 0.06
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: PRO, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
ISC	200311	200405
INV	200509	201012
IMP(C)	200509	201012
IMP(O)	200509	201512
LTM	201512	203512

RIP DATE: 201012
RC DATE: 201512

IMP(O) may include administering LUCs and a 5 year review. LUCs will continue indefinitely.

RSA-233
SMF#2 MIXING AND PREPARATION FACILITIES

SITE DESCRIPTION

RSA-233 is comprised of the Smoke Munitions Filling (SMF) #2 Mixing and Preparation Facilities. The buildings included in these operations and included in RSA-233 are as follows:

Building 1042/3642, starter mix building, was built in 1943 and used for the starter mix for the colored smoke munitions. By 1954, the facility was being used by the transportation group as a wash rack. In 1957, it was being used for storage. The building has been demolished. During the VSI, a soil/debris pile was noted near the former building location.

Building 679/3479, sleeve impregnating building, was built in 1943 and used for the impregnation of starter discs for the M-20 rifle grenades. The building has been used as a record holding station and the post veterinarian. The building is currently used as a record holding area.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-2
GW SITE #: RSA-145
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 0.7
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: Nitroaromatics, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200311	200405
SI	200405	200506
RI/FS	201001	201212

RC DATE: 201212

CLEANUP STRATEGY

Based on the results of the LSA, further investigation will be initiated to confirm the presence of suspected contamination at this site. It is anticipated that a decision document supporting a no further action decision will be required to response complete this site.

RSA-234
WASTE DISPOSAL PIT

SITE DESCRIPTION

RSA-234 is a waste disposal pit located west of Entac Circle and south of Kingfisher Rd. Originally, this area was the location of Building 642. This building was built as an IBF Plant warehouse in 1942 but was used as a loading plant for M-54 bomb mixing, filling, pressing, and assembly. The building was destroyed by fire in April 1942 after less than two months operation. It was estimated that four tons of thermate was burned in the fire. After the building burned, the concrete slab was believed to have been used as a waste burning/disposal pit for explosive wastes from various smoke mix facilities. Rejected 105mm canisters were also reportedly taken to this disposal pit and burned.

The VSI confirmed the presence of the concrete slab noting its poor condition with numerous cracks evident and a hole exposing the underlying soil. It was evident the slab was used for burning wastes and metal debris, and slag was observed on the slab.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-1
GW SITE #: RSA-145
TYPE CODE: AB
TYPE NAME: Burn Area
SITE ACRES: 0.78
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
VOCs, Nitroaromatics, PRO, Metals
MEDIA OF CONCERN:
Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200311	200405
SI	200405	200506
RI/FS	201001	201212
RD	201211	201304
RA(C)	201304	201402

RC DATE: 201402

CLEANUP STRATEGY

Based on the results of the LSA, further investigation will be initiated to confirm the presence of suspected contamination at this site. Limited soil removal is expected.

RSA-235
BULK FUEL STORAGE FACILITY

SITE DESCRIPTION

Building 649 (later renumbered 3612) was built in 1943 and used for bulk fuel storage. It is believed to have been used to store oil for heating various warehouses and change houses in Plant Area #3. Use of the building as bulk fuel storage continued into the 1950s. The VSI noted the AST has been removed.

The site will be addressed using the ARBCA program.

Direct push sample locations rendered no groundwater for chemical analysis during the limited site assessment.

STATUS

REGULATORY DRIVER: RCRA, Subtitle I
SURFACE OU: OU-2
GW SITE #: RSA-145
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 0.68
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: PRO
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
ISC	200311	200405
INV	200509	201012
IMP(C)	200509	201012
IMP(O)	200509	201512
LTM	201512	203512

RIP DATE: 201012
RC DATE: 201512

CLEANUP STRATEGY

A PBC has been awarded for INV through remedy in place followed by 5 years of IMP(O) and a 5 year review.

An investigation will be initiated to characterize and delineate petroleum-related contamination. It is anticipated that a corrective action implementing soil removal will be performed based on the results of the ARBCA Tier I report.

IMP(O) may include administering LUCs and a 5 year review. LUCs will continue indefinitely.

RSA-236
GRENADE PACKING AND ASSEMBLY

SITE DESCRIPTION

Building 636-1 (later renumbered 3563) was built in 1943 and was an assembly and packing facility for the grenade filling plant (GFP). Specifically, the building was used for final assembly, packing, and shipping of AN-M8 hand grenades, M-20 rifle grenades, and M-22 rifle grenades. The quality control inspection (i.e., burning) likely occurred down wind of the building. The building has subsequently been used as a shop in the Mechanical Section of Ordnance Guided Missile Center (OGMS). The building has since been demolished.

Direct push sample locations rendered no groundwater for chemical analysis during the limited site assessment.

CLEANUP STRATEGY

A PBC has been awarded for SI through remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-2
GW SITE #: RSA-145
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 0.6
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: PRO, SVOCs, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	200311	200405
SI	200509	201012
RA(C)	200509	201012
RA(O)	200509	201512
LTM	201512	203512

RIP DATE: 201012
RC DATE: 201512

An expanded SI will be initiated to confirm the presence of suspected contamination and will serve as the RI/FS. It is anticipated LUCs will be the remedy. LUCs and 5 year reviews are anticipated to continue indefinitely.

RSA-237
PROPELLANT CUTTING AND DRYING

SITE DESCRIPTION

Building 7556 was constructed in 1942 for use by the ROP as a primer storage magazine. Primers were offloaded from railcars and stored until needed for charge assembly in Building 7555. From 1950 to 1971, Rohm and Haas occupied the facility and used it for air drying propellant powders produced after mixing with liquid solvents at Building 7555. Solvent, binder, and propellant mixtures were brought to this facility to air dry. Once dry, the propellant was coated with the binder. The coated propellant was cut to the necessary size for research and development.

Subsequent occupation of the facility by Raytheon from 1971 to 1982 was for unknown purposes. The Army again controlled the facility from 1982 to 1985 and used it for general storage. After being acquired by Thiokol in 1985, this building was used for general storage until 1996.

During the visual site inspection, numerous floor stains were noted. The building appeared to have been used for welding and painting.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 0.21
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN:
VOCs
MEDIA OF CONCERN:
Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012
RD	201011	201104
RA(C)	201104	201202
RA(O)	201202	204102

RIP DATE: 201202
RC DATE: 204102

Evaluation of the analytical results from the limited site assessment performed indicates that this site is a probable source of TCE contamination in groundwater. Although VOC detections in soil do not exceed screening criteria, TCE was detected in groundwater. Data and operational histories from surrounding areas indicate this site to be the most probable source.

CLEANUP STRATEGY

Additional RI/FS is planned. Since the groundwater contamination appears to be isolated, the MNA will be funded under this site instead of the GW Unit. LUCs funded under RA(O) are anticipated.

RSA-238
HVA PLANT #2 MUSTARD LINES 5 & 6

SITE DESCRIPTION

RSA-238 includes the WWII HVA Plant 2 facilities Mustard lines 5 and 6. These facilities were located in the central area of RSA on the east side of Stewart Road, south of Mills Road. The facilities started operation in September and November of 1942, respectively and were shut down in May of 1943. Chemicals used in the mustard manufacturing process included, but were not limited to: fuel oil, sulfur monochloride, ethyl alcohol, chlorine, carbon tetrachloride, kerosene, acetylene tetrachloride, and sodium hypochlorite solutions. Stockpiles of material, presumably coke was observed in aerial photographs near the Plant No. 6 facility. Coke was used in the ethylene scrubber operations.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-147
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 33.2
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Mercury, Beryllium, Pesticides
MEDIA OF CONCERN: Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	200402	200405
SI	200405	200506
RI/FS	200901	201206

RC DATE: 201206

CLEANUP STRATEGY

The RI/FS has been realigned to focus on process operations identified above. Additional groundwater sourcing investigation is necessary in these newly identified areas. Possible remedial actions may be necessary based on the results of the investigation of the added operation areas and will be included in future revisions and CTC estimates.

RSA-239
LINE #1 BOILER HOUSE

SITE DESCRIPTION

Building 7668 was originally constructed by the Army in 1942 as a boiler house. Following acquisition by Thiokol in 1950, it continued to be used as a boiler house and remains a boiler house today. In 1996, it was noted that the boilers were powered by number-2 fuel oil that was supplied from four 10,000-gallon USTs located east of the building across the access road. An interview disclosed that two tanks were replaced in 1979 and that a leak was discovered in one of the new tanks in 1980. It was estimated that approximately 10,000-gallons of fuel oil leaked into the soil as a result of a broken valve. It was reported that most of the spill flowed into the sewer line and was detected at the sewage treatment plant (RSA-11). Some of the fuel oil was pumped from the sewer and soil, but no sampling data were found to document the clean up.

CLEANUP STRATEGY

RI/FS planned, soil removal, HRC injection.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-10
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 0.6
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: PAHs
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112
RD	201111	201204
RA(C)	201204	201302

RC DATE: 201302

RSA-249
INACTIVE OLD BONE YARD DISPOSAL SITE

SITE DESCRIPTION

RSA-249 is the former Salvage Yard was located on the northwest corner of Martin and Mills Roads and includes and included an area of ~22 acres. The former Salvage Yard was started in May 1942 and operations were probably discontinued in the early 1960s. The former salvage yard handled a collection of empty munitions boxes, drums, barrels, wire and numerous other items and included the disposition of various materials, including disposal of rejected chemical munitions to other components of the armed services for training purposes. The salvage yard was serviced by former R.R. No. 1 from the former North Carolina, Chattanooga and St. Louis Railroad Classification Yard. The aerial photographs from 1943, 1950, 1956, and 1959 show activity continuously at the former Salvage Yard.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-5
GW SITE #: RSA-147 & 148
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 21.8
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: VOCs, SVOCs, Pesticides
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200901	201112

RC DATE: 201112

In late 1944, the Salvage Division (which managed the former Salvage Yard) became active in redistribution and disposition of various surplus materials which included the disposal of reject chemical munitions to other components of the armed services for training purposes; manufacturing equipment of miscellaneous and specialized nature to other government projects. However, there was no evidence that any surplus items processed at the salvage yard contained CWM.

The general area of the former salvage yard is predominantly wooded with utility transmission right-of-ways through the eastern and western portions of the area. Ground vegetation was quite heavy in the northern portion of the area with metal debris observed scattered on the ground on the western boundary. Ridges or mounds were observed in the southwest portion of the area, but no debris was observed. Material identified as “slag” was also observed in a bare area in the northwestern portion of the area. Another bare area with exposed surface soil containing metal debris was observed along the eastern edge of the transmission line right-of-way on the western portion of the area. A 16’ X 35’ concrete pad with a short ramp on one end was observed on the east side of the area.

VOC, SVOC, pesticide contamination was observed in the surface and subsurface soil. Metal contamination was observed in surface soil. The groundwater is contaminated with VOCs, SVOCs, manganese, and petroleum-range organics (PRO).

CLEANUP STRATEGY

A RI will be completed. If VOCs are determined to be sourcing from this location a remedial phase will be developed.

RSA-250
FORMER STORAGE WAREHOUSE – BUILDING 778

SITE DESCRIPTION

RSA-250 is the area around former Warehouse, Building 778, which is the northern building of three former warehouses that were eventually connected to form single Building 5678. The area for RSA-250 is ~1 acre. The building is located south of Fowler Road and on the west side of Hicks Road. These former warehouse buildings (constructed in 1943) had been used for the storage of coke (used in phosgene production), unidentified components, automotive parts, blank gas mask faceplates, conveyor lines (potentially for chemical warfare manufacturing), and other inert materials. In 1948, Building 778 was used for the storage of blank gas mask faceplates. Based on 1954 building utilization, the three buildings were designated as inert material storage warehouses for the Ammo Division. The 1957 building utilization indicates that these three buildings had been converted into one building (5678) for office use. Utilization of this building during the period of 1975 to 1991 was described as administration. Currently, Building 5678 serves as the project office for PEO Aviation.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-148
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 1.3
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: SVOCs, Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201012
RD	201011	201104
RA(C)	201104	201202

RC DATE: 201202

Most of the Building 5678 interior has been completely refurbished for office space. Evidence of the former rail spur (also noted on engineering drawings) could be observed along the west side of the building. Steam lines and HVAC systems now occupy the most of the west side. The former loading pads/loading docks were visible along the west side of the building, spaced evenly five on each side with some of the former docks converted into storage rooms. Most of the drainage from the building was to the west.

Metal and SVOC contamination was observed in soil with arsenic detected at a maximum of 596 mg/kg in surface soil near former Building 778 (north end of Building 5678). Chloroform was the only parameter detected above screening levels in groundwater.

CLEANUP STRATEGY

Complete RI/FS. Two small hot spot removals are planned (56 CY and 37 CY).

RSA-252
INCENDIARY BOMB FACILITY PLANT 2 AREA

SITE DESCRIPTION

RSA-252 occupies an area of ~16 acres is located south of Mills Road, between Stewart and Refuge Roads. The main structure within RSA-252 is building 5681. Building 5681 was constructed in 1943 initially as a mustard filling plant; however, it was converted to an oil incendiary filling plant. The building had five sections; empty storage, manufacturing, filling, strapping and filled storage. Structures associated with this building included two gasoline pump houses, two gasoline storage tanks, three magazines along with various neighboring warehouses being used for storage of components. As of June 1945, the terminal date for manufacturing and filling operations, four different types of munitions had been produced at this plant. Chemicals used during incendiary operations included, but not limited to: gasoline, stearic acid, calcium, isobutyl methacrylate, magnesium particles, sodium nitrate, asphalt, and caustics. Associated waste generated from these processes was reported to have been burned at the plant burning pit located ~ 200 yards west of the plant.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-148
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 15.6
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN: PAHs, Pesticides, VOCs, Metals, PRO
MEDIA OF CONCERN: Surface & Subsurface Soil, Groundwater

Phases	Start	End
PA	200309	200406
SI	200406	200501
RI/FS	200801	201106

RC DATE: 201106

In 1947 this building was used for the bagging of DDT. Additional insecticides produced in liquid and dust forms during the 1948 - 1950 time frame in building 5681 include, but are not limited to: toxaphene, parathion, dieldrin, malathion, chlordane, pyrethrins, betahexachlorocyclohexane, cube root, aldrin, and lindane. The 1957 building use list indicated that building 5681 was utilized as an office/administration facility. Current usage remains that of administration.

Metals and SVOCs contamination was observed in soil around Building 4381. VOC and SVOC contamination was found in groundwater. Also, PRO contamination was observed in both soil and groundwater.

CLEANUP STRATEGY

A RI/FS is planned. There is insufficient data at this time to plan remedial action.

RSA-A
INACTIVE PROPELLANT STORAGE WELLS

SITE DESCRIPTION

This site is located northwest of former Building 7598 (RSA-B), in the former Redstone Arsenal Rocket Engine Facility South Plant. Building 7598 was built during the 1950s and was used for rocket motor propellant research and development. This site consists of approximately 51 steel-cased, 4-inch diameter storage wells with capped bottom ends that were used for safe storage of experimental explosives and propellants. Well depths are approximately 1 to 4 feet below ground surface. A concrete-lined sump located on the northeast side of Bldg 7598 is also being investigated as part of RSA-A.

STATUS

RRSE RATING: Low
CONTAMINANTS OF CONCERN:
Metals, VOCs
MEDIA OF CONCERN:
Surface & Subsurface Soil, Sediment

Phases	Start	End
PA	198910	199009
SI	199410	200409
RI/FS	200801	201012

RC DATE: 201012

Low levels of metals and chlorinated solvents were detected in the groundwater, low levels of metals were detected in the soil. RSA anticipates this site to be lowered to 'Low' RRSE status.

In 2004, this site was expanded and is now 1.1 acres in size.

CLEANUP STRATEGY

A supplemental SI will be required to include investigation for perchlorate in surface media. Once this additional sampling is complete, we anticipate the site will be closed via a Decision Document.

RSA-C
ABANDONED ARMY PROPELLANT MIXER BLDG

SITE DESCRIPTION

This site includes the old RSA-C area and the old RSA-82 Area. The old site RSA-C is located at former Building 7596 and is located in the Redstone Arsenal Rocket Engine South Plant. The building was used as a chemical processing facility for experimental rocket propellant mixing in the 1950s through the 1970s. Ammonium perchlorate and numerous solvents were used in the process. Wastewater was discharged via an industrial sewer to the wetlands to the east of RSA-C. Building 7595 (RSA-82), former Building 7596, and former Building 7597 (a solvent mixer line building that connected to Building 7596 via a covered walkway) are included within the area of investigation for RSA-C.

The old RSA-82 site is located at Building 7595 in the former Redstone Arsenal Rocket Engine Facility South Plant and was a propellant sparge tank with a mist eliminator, two condensers, and a condensate receiving tank. Building 7595 is located less than 150 feet to the west of Building 7596 and lies within the area of investigation for RSA-C. RSA-82 utilized methylene chloride as a mixing agent when preparing various propellant mixtures.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-11
GW SITE #: RSA-146
TYPE CODE: ID
TYPE NAME: Industrial Discharge
SITE ACRES: 3.6
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
SVOCs, Metals
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	200112
RI/FS	200801	201012

RC DATE: 201012

CLEANUP STRATEGY

Additional RI is planned.

There is insufficient data at this time to plan remedial action.

RSA-D
FORMER CYANIDE-BASE PAINTING OPERATION

SITE DESCRIPTION

This site is located in the north-central portion of the arsenal on Cajun Drive, east of Patton Road. RSA-D includes the paint shed, the paint storage shed. The facility is fenced, locked, and secure. The paint shed was approximately 12 x 20 feet with a concrete floor and was used for spray painting. The process used special cyanide-based paints which were discharged into a sump. The mobile, paint storage shed was ~8 x 8 feet and was used for storing paint, Freon, acetone and aerosols. These chemicals were periodically moved to different areas within the site boundary.

This area was part of the WWII Plant 3 IBF (incendiary bomb filling operations) being investigated under RSA-145 PSA.

A PBC has been awarded for SI through remedy in place followed by 5 years of RA(O) and a 5 year review.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-2
GW SITE #: RSA-145
TYPE CODE: SA
TYPE NAME: Storage Area
SITE ACRES: 0.25
RRSE RATING: Medium
OE: No
CONTAMINANTS OF CONCERN:
SVOCs, Metals
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	199003	199004
SI	199506	199609
RI/FS	200509	201012
LTM	201012	203012

RIP DATE: 201012
RC DATE: 203012

CLEANUP STRATEGY

RI/FS will be necessary to reevaluate/revise the existing risk assessment, including data usability, and proceed with the feasibility study, proposed plan and ROD. It is anticipated that the site will require no additional activities.

PBC AT REDSTONE

SITE DESCRIPTION

This site was created to compile all PBC Remediation Sites (RSA-048, 054, 056, 057, 059, 113, 122, 126, 134, 139, 183, 223, 224, 229, 232, 235, 236, and D).

A PBC has been awarded for SI through remedy in place followed by 5 years of RA(O) and a 5 year review.

CLEANUP STRATEGY

See the above-listed sites for individual Cleanup Strategies.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: See individual site descriptions
CONTAMINANTS OF CONCERN: See individual site descriptions
MEDIA OF CONCERN: See individual site descriptions

Phases	Start	End
PA	200412	200503
RD	200508	200509
RA(C)	200508	200909
RA(O)	200508	201309

RIP DATE: 200909
RC DATE: 201309

REDSTONE ARSENAL

Installation Restoration Program

Response Complete
Site Descriptions

MSFC-074
INACTIVE DISPOSAL SITE

SITE DESCRIPTION

MSFC-74 was a disposal area used from approximately 1949 to 1954. This unit is located in the MSFC East Test Area on Mariner Road. The area was used for disposal of construction debris. Storm water runoff drains to the east toward RSA-10. The site is 2 acres and is covered with trees and vegetation. Metals were detected in the soils in low levels. Sourcing to RSA-148 groundwater must also be evaluated for this site.

In 2005, supplemental SI work determined that the piles were a result of NASA perimeter road construction. These piles contained no evidence of debris.

CLEANUP STRATEGY

The site was closed with an administrative letter in April 2006.

STATUS

REGULATORY DRIVER: CERCLA
SURFACE OU: OU-6
GW SITE #: RSA-148
TYPE CODE: DA
TYPE NAME: Surface Disposal Area
SITE ACRES: 2
RRSE RATING: Low
OE: No
CONTAMINANTS OF CONCERN: Metals
MEDIA OF CONCERN: Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	199909
RI/FS	200006	200604

RC DATE: 200604

MSFC-082 INACTIVE CHEMICAL MUNTIONS DEMIL/DISP TRENCHES

SITE DESCRIPTION

MSFC-82 is an area formerly used to demilitarize and dispose of mustard gas artillery shells during the mid-1940s. It is located in the southwestern portion of MSFC, west of Dodd Road, south of Surveyor Street, and north of Saturn Road. This area is associated with disposal activities that took place at MSFC-003.

Response complete, site consolidated with MSFC-003.

STATUS

RRSE: Low
CONTAMINANTS:
Metals, SVOCs, CWM
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199510	200012
RI/FS	200109	200409

RC: 200409

MSFC-D FORMER FUEL OIL STORAGE CONTAINMENT BERM

SITE DESCRIPTION

MSFC-D is located east of Rideout Road and north of Pioneer Street. The site consisted of a 50% caustic processing building associated with chlorine plant 1, including multiple small tanks on the south and three 50% caustic tanks on the north.
Following chlorine plant closure, MSFC attempted to convert the three 50% caustic tanks to fuel oil storage. In 1988, a leak of ~20,000 gallons of fuel oil occurred from one of the tanks, resulting in a discharge to an adjacent drainage ditch. The tanks and the berm have since been removed.

STATUS

RRSE: Low
CONTAMINANTS: SVOCs
MEDIA OF CONCERN:
Subsurface Soil, Sediments

Phases	Start	End
PA	198910	199009
SI	199510	200109
RI/FS	200110	200409

RC: 200409

The investigation of this site needs to integrated with the investigation of chlorine plant 1 and the caustic fusion plant being performed by NASA. Groundwater investigation will be coordinated with RSA-149.

NASA will address investigation and any potential soil actions.

RSA-005
INACTIVE WASTE ACCUMULATION AREA

SITE DESCRIPTION

RSA-5 was a waste accumulation area at the RSA Motor Pool located west of Patton Road and north of Neal Road. For a period of ~10 years, drums were stored on the ground surface in a 25 foot square earthen unlined area next to Building 3630. These drums contained lube oils, paints, thinners, used oil filters, used antifreeze, and shop rags that were generated during maintenance operations at the motor pool. Drums are no longer stored at this site.

The soil and sediment is contaminated with lead.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198903	198940
SI	199510	199609
RI/FS	200110	200409

RC: 200409

Given the operational period (1980-1990) and the on-going use of the site for maintenance and motor pool operations, the site will be transferred to the RCRA program. Actions will be initiated to obtain regulatory approval for the transfer from CERCLA to RCRA that will render this site response complete.

RSA-008
INACTIVE SEWAGE TREATMENT PLANT 4

SITE DESCRIPTION

Based upon the ongoing facility use, the site is not considered ER,A-eligible.

This plant treated sewage generated in the northern portion of the facility that was primarily domestic wastewater. It is located in the northeastern section of the facility north of Martin Road, east of Patton Road, south of Hansen Road and west of McDonald Creek. The basins still function as surge capacity during high flow times. The sludge drying beds are still being used for dewatering of sludges.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199510	199809
RI/FS	200109	200212

RC: 200212

Based upon the ongoing facility use, the site is not considered DERP eligible. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. EPA has unofficially concurred and formal confirmation is forthcoming.

RSA-009
INACTIVE SEWAGE TREATMENT PLANT NO. 3

SITE DESCRIPTION

This plant treated sewage generated in the central portion of the facility that was primarily domestic wastewater. It is located in the western section of the facility south of Martin Road, west of MSFC on the west bank of Indian Creek. The basins still function as surge capacity during high flow times. The sludge drying beds are still being used for dewatering of sludges.

STATUS

RRSE: High
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199510	199809
RI/FS	199810	200212

RC: 200212

Based upon the ongoing facility use, the site is not considered DERP eligible. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. EPA has unofficially concurred and formal confirmation is forthcoming.

RSA-046
INACTIVE CHEMICAL MUNITION & DEMIL SITE

SITE DESCRIPTION

RSA-46 occupies approximately 100 acres in the southeast portion of RSA on Buxton Road, east of Patton Road. New archive search information indicates that this area was used during the 1940s and 1950s as a 4.2-inch mortar and small rocket motor test area. The onsite trenches were part of the range operational clearance activities. Limited geophysics has identified some trenches. Scrap metal and remnants of ordnance were found at the site.

STATUS

RRSE: Medium
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199310	199709
RI/FS	199710	200409

RC: 200409

Former RSA-140 is located near the firing point for the RSA-046 range and consists of construction debris (e.g. metallic objects, cement blocks, glass, charcoal, and insulation). This site was part of the larger range 2, which is being investigated as a PSA.

Metals and explosives were found in the soil and sediment associated with the surface burn and trench areas. UXO is present at the site. (RSA-046-R-01 has been opened but is listed as RC because this site is on an active range.)

Based on the new conceptual site model and its location on an active range, this site should be transferred for action under RCRA upon range closure. This site will be response complete upon regulatory approval.

RSA-050 INACTIVE MUNITIONS DEMIL & DISPOSAL AREA

SITE DESCRIPTION

RSA-50 was formerly used for the demilitarization of high explosives and white phosphorus. RSA-50 was active in the 1940s and 1950s and is located near the west-central boundary of OU-17. The site is in Test Area 6, north of the Wheeler National Wildlife Refuge, and west of Centerline Road. Originally identified as 11 acres, new data raises the area to approximately 295 acres. It includes a crest of a small knoll and other areas to the south and east.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199004
SI	199005	199009
RI/FS	199510	200409

RC: 200409

Surface water runoff flows from the site into wetlands formed by Indian Creek. RSA-50 is currently covered with small trees, grass, and brush.

Some metal debris is present on the land surface. UXO is also present at the site. PP--This site is not eligible for ER,A funds.

Given that the site is located within an operational range which includes HE and other traditional ordnance items, this site should be transferred to RCRA for ultimate action under MMR.

Actions will be initiated to obtain regulatory approval for the transfer from CERCLA to RCRA which will render this site response complete.

RSA-089
INACTIVE PROPELLANT WASTES STORAGE PAD

SITE DESCRIPTION

RSA-087, 088, 089 were all used for the same purpose. These sites are located in the east central portion of the Arsenal at the former Redstone Arsenal Rocket Engine Facility North Plant. These units provided temporary waste storage for plant waste generation points either on concrete pads or as designated spaces on asphalt for 1.3 explosive class waste propellants. Prior to RARE North Plant operations, these areas were part of Redstone Ordnance Plant burster and assembly lines. The areas investigated as RSA-087, 088, and 089 represent the waste storage pads associated with specific activities related to the solid rocket testing research only.

STATUS

RRSE: Low
CONTAMINANTS: Perchlorate
MEDIA OF CONCERN:
Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199410	199909
RI/FS	199910	200509

RC: 200509

RSA-089 is located at former Building 7726 and consists of an asphalt pad (200sf) which was used to store drummed cuttings from finished perchlorate propellant. Although the groundwater underneath the pads is contaminated with TCE, this site is not the source area. A former degreaser, located at Building 7726 (RSA-097), appears to be the source of the TCE contamination.

The groundwater contamination will be addressed as part of the remedial activities for RSA-146.

Expand RI/FS to include aerial geophysical survey. Aerial geophysics is required to identify drums and other anomalies that cannot be detected via land-based methods due to a variety of obstacles (e.g. the wetland nature of the area, surface UXO, tree cover, subsurface nature of disposal). Further investigation will focus on contaminant transport via sediment and surface water. RD/RA decisions will be made based on results of the additional investigation. Land use controls will be implemented.

This site will be addressed under RSA-097.

RSA-099
ABANDONED PLATING SHOP TANKS & SUMPS

SITE DESCRIPTION

This site is located at former Building 7614 in the southeast section of the former Redstone Arsenal Rocket Engine Facility North Plant. It consisted of a dilapidated building with plating tanks and two sumps (one indoor and one outdoor). This former single-story building was ~30 feet long and 15 feet wide. It was used for plating of rocket motor casings. The indoor sump was not equipped with a drain, and was periodically pumped to remove the accumulated wastes. The outdoor sump has no direct connection with Building 7614 plumbing.

NFA ROD approved 29 Sept 2004.

STATUS

RRSE: Low
CONTAMINANTS: Metals
MEDIA OF CONCERN:
Surface & Subsurface Soil

Phases	Start	End
PA	198910	199009
SI	199310	199909
RI/FS	199910	200409

RC: 200409

RSA-104
ABANDONED ISP WASTE DISCHARGE LINE

SITE DESCRIPTION

RSA-104 was a drainage ditch used from approximately 1949 to 1978. In 1978, drainage was re-directed to the east side of the ISP plant. The unit is near the geographic center of the Arsenal, east of the former DDT manufacturing operations, south of Mills Road and north of Huntsville Spring Branch. The unit was used for the diversion of industrial wastewater containing iron from iron carbonyl manufacturing process away from the ISP facility.

This site has been combined into RSA-117.

Potential COPCs include VOCs, Metals.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199506	199709
RI/FS	199710	200509

RC: 200509

RSA-115
INACTIVE EAST SIDE BLOWDOWN LAGOON

SITE DESCRIPTION

RSA-115 is located in the southern portion of the arsenal, south of Buxton and Pershing Roads, on the eastern side of Test Area 5 (an operational range). This area was a rocket motor test stand and blowdown lagoon and is ~7,500 square feet. The site had an unlined holding basin that contained discharged cooling water during test firings of rocket motors from the adjacent Attitude Test Stand 8887. The wastewater was held in the lagoon until it evaporated and/or percolated through the soil. The cooling water mixed with the rocket motor exhaust containing unsymetrical dimethyl hydrazine as the primary active fuel ingredient and red fuming nitric acid as the primary oxidant. The lagoon has an earthen berm and is surrounded by small pine trees. PP--This site is considered non-eligible for ER,A funds.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199010	199109
RI/FS	199110	200509

RC: 200509

This site is configured such that rocket motor testing/blowdown activities could be resumed at anytime; therefore, the site is considered active and will be transferred to the RCRA program pending regulatory approval. Once regulatory approval is obtained, the CERCLA site will be rendered response complete.

RSA-116
FORMER OPERATIONS AT SOUTH SIDE LAGOON

SITE DESCRIPTION

RSA-116 is approximately 4.5 acres and located in the southern portion of the Arsenal, south of Buxton and Pershing Roads, on the south side of Test Area 5. The site was an unlined holding basin for containment of spent cooling water discharged during test firings of rocket motors from Test Stand 8879. The cooling water was mixed with rocket motor exhaust. The spent cooling water was held in the lagoon and evaporated and/or percolated through the soil. There was a release structure at the base of the lagoon for drainage to a creek. In 1993, the lagoon was upgraded and lined, and an 8-feet tall chain link fence was installed. The site continues to be operated as a rocket motor test area.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199010	199109
RI/FS	199110	200212

RC: 200212

Based upon the ongoing facility use, the site is not eligible for ER,A funding. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. EPA has unofficially concurred and formal confirmation is forthcoming.

RSA-118
INACTIVE IND. DITCH & DISCHARGE LAGOON

SITE DESCRIPTION

RSA-118 was a former ammonia lagoon used from approximately 1949 to the mid 1980s. It is ~5 acres in size. It is east of the former DDT Drainage Ditches, south of Mills Road, and north of Huntsville Spring Branch. ISP, Inc. manufactured carbonyl iron powder, and for a brief time (6 months) produced nickel carbonyl. This unit was a holding pond for discharges of wastewater containing ammonia generated by ISP, Inc. operations.

This area is within the southern draining of the revised RSA-117 site boundary.

This site has been included in RSA-117.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199506	199609
RI/FS	199610	200409

RC: 200409

RSA-129
FORMER BURN PAD & CAPPED WASHOUT PIT

SITE DESCRIPTION

RSA-129 consists of an unlined concrete pit, unlined earthen settling pond, and an open field with various abandoned structures used to support testing. It is located in the east central portion of the arsenal at the north end of Magazine Road in the north plant of the RARE Facility. RSA-129 is bounded on the north, east, and west by wetlands that are associated with the Huntsville Spring Branch. The entire site is ~3.5 acres. RSA-129 has been used for a variety of programs, primarily propellant R&D, and for cleaning out defective rocket motor casings.

STATUS

RRSE: Medium
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198810	198909
SI	198910	199009
RI/FS	199010	200509

RC: 200509

This site is within TA-10 and is actively used for propellant and explosives testing.

Historical research has determined that this site was never used for CWM disposal. Since this site has been consistently used as a military range it will be transferred to the RCRA program pending regulatory approval.

RSA-E
FUEL OIL SPILL AT FUEL FARM-TANK 5693

SITE DESCRIPTION

RSA-E resulted from a No. 2 Fuel Oil spill at the above ground storage tank farm in the central portion of RSA. Several large above ground storage tanks are located adjacent to the north side of the site. A fence crosses the northern portion of the site. A drainage ditch flows from the northeastern side of the site south along the eastern and southern sides of the site. A large portion of the center of the site is wooded. This 10-acre area, drains to a wetland area.
The fuel was released into a containment basin formed by an earthern berm built around the tank. Approximately 30,000 gallons of fuel oil seeped into the soil and groundwater. Approximately 366,000 gallons of oil/water mixture were reportedly recovered from the trench over a period of six months.

TPH and SVOCs (free product) were detected in the soil and groundwater.

Based upon the ongoing facility use, the site is not considered DERP eligible. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. EPA has unofficially concurred and formal confirmation is forthcoming.

STATUS

RRSE: Medium
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199440	199909
RI/FS	200010	200212

RC: 200212

RSA-F
FENCED OPEN STORAGE/LAYDOWN YARD

SITE DESCRIPTION

RSA-F is located in the area northwest of the intersection of Mills and Jungerman roads in central RSA. This open storage area and lay down yard is approximately 1.5 acres. The site is fenced, locked and secure, and is overlain with gravel. A PCB spill occurred at this site but residual levels are low.

Based upon the ongoing facility use, the site is not considered DERP eligible. A request has been forwarded to EPA/ADEM to remove this site from the CERCLA program. Approval from ADEM was granted on 4 Feb 03. EPA has unofficially concurred and formal confirmation is forthcoming.

STATUS

RRSE: Low
CONTAMINANTS: None
MEDIA OF CONCERN: None

Phases	Start	End
PA	198910	199009
SI	199506	199909
RI/FS	200010	200212

RC: 200212

IRP No Further Action Sites Summary

AEDBR #	Site Title	Documentation/Reason for NFA	NFA Date
MSFC-055	Dismantled Stauffer Chem.Mfg. Plant Site	Other	199909
MSFC-060	Inactive Deluge Water Drainage Sys.	Study Completed, No Cleanup Required	199909
MSFC-065	Former Pesticide Storage Surface Drain	Other	199909
MSFC-074	Inactive Disposal Site	Study Completed, No Cleanup Required	200604
MSFC-082	Inactive Chem Munts Delim/Disp Trenches	Other	200409
MSFC-D	Former Fuel Oil Storage Containment Berm	Other	200409
RSA-001	Fox Army Community Hospital Incinerator	Study Completed, No Cleanup Required	199102
RSA-002	In-Ground Oil/Water Separator Bldg.3338	Not Eligible for ER,A/BRAC Funding	199102
RSA-003	In-Ground Oil/Water Separator Bldg.3617	Not Eligible for ER,A/BRAC Funding	199102
RSA-004	In-Ground Oil/Water Separator & Washrack	Not Eligible for ER,A/BRAC Funding	199102
RSA-005	Inactive Waste Accumulation Area	Other	200409
RSA-006	Paint Shop & Sumps Bldg 3634 Motor Pool	Not Eligible for ER,A/BRAC Funding	199102
RSA-007	Hazardous Waste Storage Area Bldg. 3775	Study Completed, No Cleanup Required	199102
RSA-008	Inactive Sewage Treatment Plant 4	Not Eligible for ER,A/BRAC Funding	200212
RSA-009	Inactive Sewage Treatment Plant No 3	Not Eligible for ER,A/BRAC Funding	200212
RSA-012	Active Open Burn Pans	Not Eligible for ER,A/BRAC Funding	199102
RSA-015	Hazardous Waste Storage Igloo No. 1	Study Completed, No Cleanup Required	199102
RSA-016	Hazardous Waste Storage Igloo No. 2	Study Completed, No Cleanup Required	199102
RSA-017	Hazardous Waste Storage Igloo No. 3	Study Completed, No Cleanup Required	199102
RSA-018	Hazardous Waste Storage Igloo No. 4	Study Completed, No Cleanup Required	199102
RSA-019	Hazardous Waste Storage Igloo No. 5	Study Completed, No Cleanup Required	199102
RSA-020	Hazardous Waste Storage Igloo No. 6	Study Completed, No Cleanup Required	199102
RSA-021	Hazardous Waste	Study Completed, No Cleanup Required	199102

AEDBR #	Site Title	Documentation/Reason for NFA	NFA Date
	Storage Igloo No. 7		
RSA-022	Hazardous Waste Storage Igloo No. 8	Study Completed, No Cleanup Required	199102
RSA-023	Hazardous Waste Storage Igloo No. 9	Study Completed, No Cleanup Required	199102
RSA-024	Haz. Waste Vacant Storage Igloo No. 10	Study Completed, No Cleanup Required	199102
RSA-025	Haz. Waste Vacant Storage Igloo No. 11	Study Completed, No Cleanup Required	199102
RSA-026	Haz. Waste Vacant Storage Igloo No. 12	Study Completed, No Cleanup Required	199102
RSA-027	Haz. Waste Vacant Storage Igloo No. 13	Study Completed, No Cleanup Required	199102
RSA-028	In-Ground Oil/Water Separator 5693 Area	Not Eligible for ER,A/BRAC Funding	199102
RSA-029	Redstone Arsenal Sanitary Sewer System	Study Completed, No Cleanup Required	199102
RSA-030	Central Oil/Water Separator	Not Eligible for ER,A/BRAC Funding	199102
RSA-031	Central Oil/Water Separator Storage Tank	Not Eligible for ER,A/BRAC Funding	199102
RSA-033	Plating Room Floor Drains Bldg. 5432	Not Eligible for ER,A/BRAC Funding	199102
RSA-034	Waste Aviation Fuel Temp. Storage Area	Not Eligible for ER,A/BRAC Funding	199102
RSA-035	In-Ground Oil/Water Separator Bldg.4812	Not Eligible for ER,A/BRAC Funding	199102
RSA-036	In-Ground Oil/Water Separator Bldg.4832	Not Eligible for ER,A/BRAC Funding	199102
RSA-037	Removed Used Oil UST Site Tank #7846	Not Eligible for ER,A/BRAC Funding	199102
RSA-038	Removed Used Oil UST Site Tank #3240d	All Required Cleanup(s) Completed	199606
RSA-039	Removed #2 Fuel Oil UST Site Tank #3338	Study Completed, No Cleanup Required	199308
RSA-040	Removed Used Oil UST Site Tank #3617	Study Completed, No Cleanup Required	199603
RSA-041	Removed Used Oil UST Site Tank #3636	Study Completed, No Cleanup Required	199207
RSA-042	Removed O.W. Sep. Storage Tank #4812 Site	Not Eligible for ER,A/BRAC Funding	199102
RSA-043	Removed Used Oil UST Site Tank #3665	Study Completed, No Cleanup Required	199307
RSA-044	Removed Used Oil UST Site Tank #5435b	Not Eligible for ER,A/BRAC Funding	199102
RSA-046	Inactive Chemical	Not Eligible for ER,A/BRAC, due to	200409

AEDBR #	Site Title	Documentation/Reason for NFA	NFA Date
	Munition & Demil Site	active range	
RSA-050	Inactive Munitions Demil & Disposal Area	Not Eligible for ER,A/BRAC, due to active range	200409
RSA-055	Inactive Sanitary & Industrial Landfill	Other	200202
RSA-062	Inactive Munitions Demil & Disposal Area	Will be addressed under RSA-061	200202
RSA-070	Former Chemical Drum Storage Area	Will be addressed under RSA-069	200202
RSA-071	High Explosive Drop Test Site Area	Not Eligible for ER,A/BRAC Funding	199102
RSA-072	Mortar Shell Test Site Area	Not Eligible for ER,A/BRAC Funding	199102
RSA-073	High Explosive Impact Test Site (West)	Not Eligible for ER,A/BRAC Funding	199102
RSA-074	High Explosive Impact Test Site (East)	Not Eligible for ER,A/BRAC Funding	199102
RSA-075	Inactive Solid Waste Incinerator	Study Completed, No Cleanup Required	199102
RSA-076	Removed RDX/HMX Filtration Unit 1 North	Study Completed, No Cleanup Required	199102
RSA-077	Removed RDX/HMX Filtration Unit 1 South	Study Completed, No Cleanup Required	199102
RSA-078	Former RDX/HMX Filtration Unit 1 Sump North	Study Completed, No Cleanup Required	199102
RSA-079	Former RDX/HMX Filtration Unit 1 Sump South	Study Completed, No Cleanup Required	199102
RSA-080	Former RDX/HMX Suspen. Transfer Pad/Sump	Study Completed, No Cleanup Required	199102
RSA-081	Removed RDX/HMX Charcoal Column Dolly	Study Completed, No Cleanup Required	199102
RSA-082	Former Sparge Unit Site Bldg 7595	Other	200212
RSA-084	Inactive Propellant Wastes Storage Pad	Study Completed, No Cleanup Required	199708
RSA-085	Inactive Propellant Wastes Storage Pad	Not Eligible for ER,A/BRAC Funding	199102
RSA-086	Inactive Propellant Wastes Storage Pad	Not Eligible for ER,A/BRAC Funding	199102
RSA-089	Inactive Propellant Wastes Storage Pad	Study Completed, No Cleanup Required	200509
RSA-090	Inactive Propellant Wastes Storage Pad	Study Completed, No Cleanup Required	199102

AEDBR #	Site Title	Documentation/Reason for NFA	NFA Date
RSA-091	Inactive Propellant Wastes Storage Pad	Study Completed, No Cleanup Required	199102
RSA-092	Inactive Propellant Wastes Storage Pad	Study Completed, No Cleanup Required	199102
RSA-093	Former Reclaimed Empty Drum Storage Area	Study Completed, No Cleanup Required	199102
RSA-099	Abandoned Plating Shop Tanks & Sumps	All Required Cleanup(s) Completed	200409
RSA-100	Removed Above Ground Used Oil Tank	Study Completed, No Cleanup Required	199102
RSA-101	Encapsulated Pesticide Contam. Sed. Area	All Required Cleanup(s) Completed	198803
RSA-102	Dismantled Pesticide Mfg. Plant Site	All Required Cleanup(s) Completed	198803
RSA-103	Capped Pesticide Settling Lagoon	All Required Cleanup(s) Completed	198803
RSA-104	Abandoned ISP Waste Discharge Line	Study Completed, No Cleanup Required	200509
RSA-105	Inactive Closed DDT Drainage Ditches	All Required Cleanup(s) Completed	198803
RSA-106	Earthen Retention Dams For DDT Migration	All Required Cleanup(s) Completed	198803
RSA-107	Closed DDT Contam.Soils/Debris Landfill	All Required Cleanup(s) Completed	198303
RSA-108	Test Range 4 Missile Impact Site	Study Completed, No Cleanup Required	199708
RSA-111	Construction Debris	Study Completed, No Cleanup Required	199102
RSA-115	Inactive East Side Blowdown Lagoon	Not Eligible for ER,A/BRAC Funding	200509
RSA-116	Former Operations Ar So Side Lagoon	Not Eligible for ER,A/BRAC Funding	200212
RSA-118	Inactive Ind Ditch & Discharge Lagoon	This site has been included in RSA-117.	200409
RSA-119	ISP International Manufacturing Plant	Study Completed, No Cleanup Required	199102
RSA-120	Matthews Cave And Ravine	Study Completed, No Cleanup Required	199102
RSA-121	Paint Shop/Paint Washout Booth Bldg.4762	Not Eligible for ER,A/BRAC Funding	199102
RSA-123	Inactive Cement Plant Sump	Study Completed, No Cleanup Required	199102
RSA-124	Dismantled Calgon WTP Process Equipment	Study Completed, No Cleanup Required	199102
RSA-125	Waste Accumulation Area Bldg. 5477	Not Eligible for ER,A/BRAC Funding	199102

AEDBR #	Site Title	Documentation/Reason for NFA	NFA Date
RSA-127	Photo Lab Wastewater Sump Bldg. 5451	Not Eligible for ER,A/BRAC Funding	199102
RSA-128	Inactive Mustard Gas Demil Area	Other	200202
RSA-129	Former Burn Pad & Capped Washout Pit	Not Eligible for ER,A/BRAC Funding	200509
RSA-130	Inactive Photolab Septic Tank-Bldg.7345	All Required Cleanup(s) Completed	199710
RSA-131	Active Open Detonation Area	Not Eligible for ER,A/BRAC Funding	199102
RSA-132	Dismantled & Removed Popping Furnace	Other	200202
RSA-133	Inactive Rocket Washout Rack & Sump	Other	200202
RSA-B	Abandoned Army Propellant Mfg. Bldg 7598	Study Completed, No Cleanup Required	199708
RSA-E	Fuel Oil Spill From Tank #5693	Not Eligible for ER,A/BRAC Funding	200212
RSA-F	Former Operations At Open Storage Yard	Not Eligible for ER,A/BRAC Funding	200212

Initiation of IRP: 1977

Past Phase Completion Milestones

1995

OU-6

- REM (Cap), RSA-56
- REM (Cap), RSA-139

1997

OU-9

- REM (Removal of Septic Tank), RSA-130

OU-10

- RC, RSA-84
- REM, RSA-142

OU-11

- RC, RSA-B

OU-12

- RC, RSA-B

OU-14

- IRA, RSA-13, 132,133, Reclassified

OU-16

- RC, RSA-108

OU-18

- IRA (Fencing), RSA-141 (approached NASA to discuss possibility of transferring site
- RC, MSFS-D, NASA has assumed responsibility of this site

1999

OU-5

- REM (Cap), RSA-49

OU-6

- IRA , RSA-10

OU-14

- IRA, RSA-14, Reclassified

OU-18

- RC, MSFS-60

2000

OU-10

- IRA, RSA-95
- REM, RSA-96

2001

OU-4

- REM (Fencing), RSA-114

OU-5

- REM (Fencing), RSA-49
- REM (Fencing), MSFC-49

OU-6

- REM (Fencing), RSA-53
- REM (Fencing), RSA-54/55
- REM (Fencing), RSA-59
- REM (No Dig Policy, RSA-122
- REM (CAP/Extension/Fencing), RSA-139

OU-7

- REM (Fencing/Signage), RSA-58
- REM (Fencing), RSA-112/128
- REM (Fencing), RSA-113

OU-8

- REM (Fencing), RSA-52
- REM (Fencing), RSA-61/62

OU-15

- REM (Fencing), RSA-65
- REM (Barium Drum Removal, Fencing), RSA-65
- REM (Fencing), RSA-66
- REM (Fencing), RSA-67
- REM (Fencing), RSA-68
- REM (Fencing), RSA-69/70
- REM (Fencing), RSA-110

OU-17

- REM, RSA-63

2004

OU-1

- RFI, RSA-143
- CAP, RSA-143

2004 (continued)
OU-10
- REM, RSA-11
- RI/FS, RSA-99
- ROD, RSA-099

2005
OU-6
- SI, MSFC-074

2006
OU-6
- RI/FS, RSA-057

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates: 2014

Projected Construction Completion Date of IRP: 2014

Projected Date for Deletion from NPL: 2020

Schedule for Next Five-Year Review: 2011

Estimated Completion Date of IRP (including LTM phase): 2044

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
MSFC-002	RI/FS									
	RD									
	RA(C)									
MSFC-003	RI/FS									
MSFC-027	RI/FS									
MSFC-034	RI/FS									
	RD									
	RA(C)									
	RA(O)									201806
	LTM									204306
MSFC-035	RI/FS									
MSFC-053	RI/FS									
	RA(C)									
	RA(O)									201706
	LTM									204206
MSFC-077	RI/FS									
RSA-011	RI/FS									
	RD									
	RA(C)									
	RA(O)									
	LTM									203803
RSA-013	RI/FS									
	RA(C)									
	RA(O)									201708
	LTM									204208
RSA-014	RI/FS									
	RA(C)									
	RA(O)									201708
	LTM									204208
RSA-032	RI/FS									
RSA-045	RI/FS									
	RD									
	RA(C)									

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-047	RI/FS									
RSA-048	RI/FS									
	RD									
	RA(C)									
	RA(O)									201704
	LTM									204204
RSA-049	RI/FS									
	RA(C)									
	RA(O)									
	LTM									203803
RSA-051										
RSA-052	RI/FS									
	RD									
	RA(C)									
	RA(O)									201808
	LTM									204308
RSA-053	RI/FS									
	RD									
	RA(C)									
	RA(O)									201507
	LTM									204007
RSA-054	RI/FS									
	RD									
	RA(C)									
	RA(O)									201604
	LTM									204104
RSA-056	RI/FS									
	RD									
	RA(C)									
	RA(O)									201604
	LTM									204104
RSA-057	RI/FS									
	RD									
	RA(C)									
	RA(O)									
	LTM									203711

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-058	RI/FS									
	RD									
	RA(C)									
	RA(O)									201507
	LTM									204007
RSA-059	RI/FS									
	RA(C)									
	RA(O)									201512
	LTM									204012
RSA-060	RI/FS									
	RD									
	RA(C)									
	RA(O)									201507
	LTM									204007
RSA-061	RI/FS									
	RD									
	RA(C)									
	RA(O)									201808
	LTM									204308
RSA-063	RI/FS									
	RA(C)									
	RA(O)									201804
	LTM									204304
RSA-064	RI/FS									
	RD									
	RA(C)									
	RA(O)									201808
	LTM									204308
RSA-065	RI/FS									
RSA-066	RI/FS									
	RA(C)									
	RA(O)									201702
	LTM									204202
RSA-067	RI/FS									

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-068	RI/FS									
	RA(C)									
	RA(O)									201702
	LTM									204202
RSA-069	RI/FS									
RSA-083	RI/FS									
	RD									
	RA(C)									
	RA(O)									201602
RSA-087	RI/FS									
	RD									
	RA(C)									
	RA(O)									201502
RSA-088	RI/FS									
	RD									
	RA(C)									
	RA(O)									201502
RSA-094	RI/FS									
RSA-095	RI/FS									
	RD									
	RA(C)									
RSA-096	RI/FS									
	RD									
	RA(C)									
	RA(O)									
	LTM									203906
RSA-097	RI/FS									
	RD									
	RA(C)									
	RA(O)									
RSA-109	RI/FS									
	RA(C)									
	RA(O)									201902
	LTM									204402

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-110	RI/FS									
	RA(C)									
	RA(O)									201708
	LTM									204208
RSA-112	RI/FS									
	RA(C)									
	RA(O)									201908
	LTM									204408
RSA-113	RI/FS									
	RD									
	RA(C)									
	RA(O)									201702
	LTM									204202
RSA-114	RI/FS									
	IRA									
RSA-117	RI/FS									
	RD									
	RA(C)									
RSA-122	RI/FS									
	RD									
	RA(C)									
	RA(O)									201411
	LTM									203911
RSA-126	RI/FS									
	RA(C)									
	RA(O)									201512
	LTM									204012
RSA-134	RI/FS									
	RA(C)									
	RA(O)									201702
	LTM									204102

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-135H	RI/FS									
	RD									
	RA(C)									
	LTM									201702
RSA-138M	RI/FS									
RSA-139	RI/FS									
	RA(C)									
	RA(O)									201602
	LTM									204102
RSA-140	RI/FS									
RSA-141	RI/FS									
	RA(C)									
	LTM									203802
RSA-142	RI/FS									
	RD									
	RA(C)									
	RA(O)									201607
RSA-143	IMP(O)									
RSA-144	RI/FS									
	RD									
	RA(C)									
	RA(O)									201602
RSA-145	RI/FS									
	RA(C)									
	RA(O)									201702
	LTM									204202
RSA-146	RI/FS									
	RD									
	RA(C)									
	RA(O)									202202
	LTM									204202
RSA-147	RI/FS									
	RD									
	RA(C)									
	RA(O)									202302
	LTM									204302

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-148	RI/FS									
	RA(C)									
	RA(O)									201802
	LTM									204302
RSA-149	RI/FS									
	RA(C)									
	RA(O)									201802
	LTM									204302
RSA-150	RI/FS									
	LTM									203706
RSA-151	RI/FS									
	RD									
	RA(C)									
	RA(O)									202302
	LTM									204302
RSA-152	RI/FS									
	RD									
	RA(C)									
	RA(O)									202302
	LTM									204302
RSA-153	RI/FS									
	LTM									204206
RSA-154	RI/FS									
	LTM									204306
RSA-155	RI/FS									
RSA-156	RI/FS									
	RA(C)									
	RA(O)									201909
	LTM									204409
RSA-157	RI/FS									
RSA-183	RI/FS									
	RD									
	RA(C)									
	RA(O)									201411
	LTM									203911
RSA-187	RI/FS									
	RD									
	RA(C)									

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-188	RI/FS									
	RD									
	RA(C)									
	RA(O)									201802
	LTM									204302
RSA-189	RI/FS									
	RA(C)									
RSA-190	RI/FS									
RSA-191	RI/FS									
RSA-192	RI/FS									
	RA(C)									
RSA-193	RI/FS									
RSA-194	RI/FS									
RSA-195	RI/FS									
RSA-196	RI/FS									
RSA-197	RI/FS									
RSA-198	RI/FS									
	RA(C)									
RSA-199	RI/FS									
RSA-200	RI/FS									
	RD									
	RA(C)									
	RA(O)									201602
RSA-201	RI/FS									
RSA-202	RI/FS									
RSA-203	RI/FS									
RSA-204	RI/FS									
	RD									
	RA(C)									
	RA(O)									201708
RSA-205	RI/FS									
RSA-206	RI/FS									
RSA-207	RI/FS									
RSA-208	RI/FS									
RSA-209	RI/FS									
RSA-210	RI/FS									
RSA-211	RI/FS									
RSA-212	RI/FS									

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-213	RI/FS									
	RD									
	RA(C)									
	RA(O)									204108
RSA-214	RI/FS									
RSA-215	RI/FS									
	RD									
	RA(C)									
	RA(O)									204208
RSA-217	RI/FS									
	RD									
	RA(C)									
	RA(O)									204308
RSA-218	RI/FS									
	RD									
	RA(C)									
RSA-219	RI/FS									
	RD									
	RA(C)									
	RA(O)									204208
RSA-220	RI/FS									
	RA(C)									
	RA(O)									201806
	LTM									204306
RSA-223	PA/SI									
	LTM									203909
RSA-224	PA/SI									
	LTM									203512
RSA-225	RI/FS									
	RD									
	RA(C)									
RSA-226	PA/SI									
RSA-227	RI/FS									
	RA(C)									
RSA-228	RI/FS									
	RD									
	RA(C)									

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-229	INV									
	CAP									
	DES									
	IMP(C)									
	IMP(O)									202208
	LTM									202708
RSA-230	RI/FS									
	RA(C)									
	RA(O)									201706
	LTM									204206
RSA-231	RI/FS									
RSA-232	INV									
	IMP(C)									
	IMP(O)									201512
	LTM									203512
RSA-233	RI/FS									
RSA-234	RI/FS									
	RD									
	RA(C)									
RSA-235	INV									
	IMP(C)									
	IMP(O)									201512
	LTM									203512
RSA-236	PA/SI									
	RA(C)									
	RA(O)									201512
	LTM									203512
RSA-237	RI/FS									
	RD									
	RA(C)									
	RA(O)									204102
RSA-238	RI/FS									
RSA-239	RI/FS									
	RD									
	RA(C)									
RSA-249	RI/FS									

Redstone Arsenal IRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
RSA-250	RI/FS									
	RD									
	RA(C)									
RSA-252	RI/FS									
RSA-A	RI/FS									
RSA-C	RI/FS									
RSA-D	RI/FS									
	LTM									203012
PBC at Redstone	RA(C)									
	RA(O)									

Prior Years Funds

Total Funding up to FY04: $122,166K

FY05 Prior Year Funds

Site Information	Expenditures	FY Total
RI, MSFC-002	$ 242.35K	
RI, MSFC-074	$ 22.73K	
RI, RSA-011	$ 297.31K	
RI, RSA-049	$ 12.40K	
RI, RSA-053	$ 35.45K	
RI, RSA-058	$ 845.55K	
RI, RSA-060	$ 12.00K	
RI, RSA-096	$ 403.59K	
RI, RSA-097	$ 356.05K	
RI, RSA-098	$ 140.93K	
RA(C), RSA-143	$ 16.91K	
RI, RSA-145	$ 803.74K	
RI, RSA-146	$ 854.21K	
RI, RSA-147	$ 661.24K	
RI, RSA-148	$ 524.26K	
RI, RSA-149	$ 430.32K	
RI, RSA-151	$ 681.19K	
RI, RSA-152	$ 680.95K	
RI, RSA-156	$ 618.99K	
RA(C), PBC at Redstone	$ 1,388.53K	**$9,028.70K**

Total Prior Year Funds: $131,194.7K

Current Year (FY06) Requirements

Site Information	Requirements	FY Total
RI/FS, RSA-087	$ 153.06K	
RI/FS, RSA-088	$ 153.01K	
RI/FS, RSA-094	$ 134.28K	
RI/FS, RSA-095	$ 209.52K	
RI, RSA-122	$ 9.52K	
RI, RSA-142	$ 1,669.32K	
RA(C), RSA-143	$ 15.00K	
RI, RSA-146	$ 293.56K	
RI, RSA-156	$ 15.00K	
RI, RSA-196	$ 769.74K	
RI, RSA-A	$ 10.00K	
RI, RSA-C	$ 15.00K	
PBC at Redstone	$12,936.25K	**$12,936.25K**

Total Future Requirements: **$238,390K**
Total IR Program Cost *(from inception to completion of the IRP):* **$382,520.95K**

REDSTONE ARSENAL

Military Munitions Response Program

MMRP Summary

Total AEDB-R MMRP Sites/AEDB-R sites with Response Complete: 23/17

AEDB-R Site TYPES:

1 Burn Area	16 Chemical Disposal
1 Explosive Ordnance Disposal Area	1 Pistol Range
4 Unexploded Munitions/Ordnance	

Most Widespread Contaminants of Concern: UXO

Media of Concern: Soil

Completed REM/IRA/RA: None

Total MMRP Funding

Prior years (up to FY05):	$	0
Current Year (FY06):	$	397,000
Future Requirements (FY07+):	$	27,582,000
Total:	$	27,979,000

Duration of MMRP

Year of MMRP Inception: 2003
Year of MMRP RIP/RC: 2017/2032
Year of MMRP Completion Including LTM: 2047

MMRP Contamination Assessment

MMRP Contamination Assessment Overview

1. The National Defense Authorization Act (NDAA) for FY02 (Public Law 107-107) amended the Defense Environmental Restoration Program (DERP) by establishing a new program element for the cleanup of property known or suspected to contain unexploded ordnance (UXO), discarded military munitions (DMM) and/or munitions constituents (MC). It requires the Army to develop and maintain an inventory of Defense Sites (referred to as munitions response sites or MRS) that are known or suspected to contain UXO, DMM, and/or MC for sites than are not located on operational ranges, operating manufacturing or storage facilities, or permitted demilitarization facilities. This program element is called the Military Munitions Response Program (MMRP) and is funded separately from the DERP. However, because the Army had previously conducted responses on sites known or suspected to contain UXO, DMM, and/or MC, munitions response action can occur under the IRP category or the MMRP category. Under the MMRP category, the Army may conduct munitions response activities when:

- The release occurred prior to September 30, 2002; and
- The release is at a site that is not a FUDS, an operational range, an active munitions demilitarization facility, or an active waste military munitions (WMM) treatment or disposal unit that operated after September 30, 2002; and
- The site's MMRP costs were not identified or included in the DERP IRP database prior to September 30, 2002.

The Army was required to initiate an inventory of defense sites or MRS with UXO, DMM, and/or MC by May 31, 2003, and update the inventory annually until complete. The data collected during this inventory on defense sites provides the MRS that will be addressed as MMRP category sites. The range inventory consisted of three phases. Phase I, Advance Range Survey (ARS), was completed between September to December 2000. The ARS was followed by Phase 2, the Active/Inactive Range Inventory, with data being collected from October 2000 through January 2003. The final phase, Phase 3, was the Closed, Transferred, and Transferring Range Inventory which was completed between October 2001 and December 2003. These three phases were completed specifically for RSA during the following time periods:
Phase 1 – ARS (which included RSA) was completed December 2000
Phase 2 – A/I Range Inventory for RSA completed July 2001
Phase 3 – CTT Range Inventory for RSA completed September 2002

2. Number of Sites.
The number of MMRP sites on RSA has been difficult to determine due to an inaccurate A/I range inventory. The RSA range inventory is in the process of being corrected. Based on the inaccurate A/I range inventory, the previous CTT inventory identified 23 MRS sites that were MMRP eligible. However, most of these sites are located on Operational Ranges. The terminology "Operational Ranges" has since collectively replaced the terminology "Active/Inactive Ranges". The current number of MMRP-eligible sites on RSA, based on the corrected range inventory, is four. They consist of MSFC-003-R-01, RSA-001-R-01, RSA-004-R-01, and RSA-141-R-01.

Offsite Issues:
Site RSA-001-R-01 is a 49-acre portion of RSA that was transferred to the State of Alabama for the construction of Highway 565. The Army disclosed to the state that the possibility existed for the presence of UXO on this parcel and performed a visual sweep for UXO and ordnance related residue prior to construction. No complete subsurface survey has been conducted. The extent of UXO or related materials (if any) found during construction is not known.

Regulatory Interest:
There is high regulatory interest in regard to the munitions and explosives of concern on RSA. There has been a great deal of confusion in regard to split of responsibility between the IRP and MMRP for sites on the arsenal. Many of the issues causing the confusion are being worked out at the Army level and we have begun discussions with the regulators to sort through and alleviate the confusion.

Issues and Concerns:
The most pressing concern remains the need to get the RSA range inventory maps corrected. Other concerns include the naming convention used for the MMRP sites that are not currently active under the IRP or Compliance-Related Cleanup (CC). The site names very closely resemble other sites on RSA that are not active at this time, but still exist on the Hazardous Waste Permit and in our databases. For instance, one of the new MMRP sites is numbered MSFC-003-R-01. In this case, MSFC-003 is an active IRP site, so the addition of the "-R-01" to the site number still refers to the geographic area that makes up site MSFC-003. However, new MMRP sites RSA-001-R-01 and RSA-004-R-01 are not located on an existing IRP or CC site. Unfortunately the root names, RSA-001 and RSA-004, are existing inactive CC sites and refers to a geographic location that is not associated with the location of the new MMRP sites. However, sites RSA-001 and RSA-004 are listed in our Hazardous Waste Permit as the location of the inactive sites. This has already caused confusion at the installation level and we anticipate will cause further confusion in regard to the permit.

Public Interest:
As yet, there is little to no public interest in the MMRP sites. Most are located within the boundaries of RSA and the MSFC. The site located off the installation is being used as part of the Highway 565 roadway and, therefore, has very limited access to the public other than use as a roadway.

3. To date there have been no responses to the MMRP sites other than the effort to identify them properly.

MMRP Cleanup Exit Strategy:
Site Inspection is now underway. Once the SI is completed, sites will be addressed in priority order based upon MRSPP and Program funding availability.

REDSTONE ARSENAL

Military Munitions Response Program

Site Descriptions

MSFC-003-R-01
MSFC-3

SITE DESCRIPTION

The site is a 15.7-acre former disposal site for chemical munitions and related wastes. The site is located in MSFC property, west of Dodd Road. The site was used to dispose (by burial) of unused toxic chemical munitions including mustard gas shells in the 1940's and 1950's. According to a preliminary assessment and site investigation completed in 1998, in 1960, partial decontamination at the unit took place and was documented by a decontaminated certificate dated September 23, 1960. This decontamination consisted of clearing and burning vegetation and screening and discing the top six inches of topsoil with bleach. No large-scale decontamination efforts were undertaken at the site. The site is in the RSA IRP in the remedial investigation (RI) phase. The undeveloped area is not fenced but it is being covered in the Arsenal's hazardous waste site access control program.

The shape file that was provided with the CTT Range Inventory document shows that this site is the original MSFC-003 area. The CWM probability assessment for the installation shows that there is an "occasional" probability of encountering CWM at this site.

In 2005, RSA-002-R-01 was combined with this site.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: Serious Risk

CONTAMINANTS OF CONCERN: UXO

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200201	200305
SI	200601	200712
RI/FS	200910	201009
RD	201510	201609
RA(C)	201610	201709
RA(O)	201710	203209
LTM	203210	204709

RIP DATE: 201710
RC DATE: 203209

CLEANUP STRATEGY

Complete SI. RI/FS is planned. Remedial Action is assumed including RD, Excavation, Off-Site Transportation and Disposal, Groundwater Extraction Wells, Metals Precipitation and Carbon Adsorption followed by 5 year reviews and O & M.

OE: Site Characterization and Removal Assessment is planned. Removal Action, Institutional Controls and Monitoring are anticipated.

MSFC-003-R-02
MSFC-3 (CWM)

SITE DESCRIPTION

Delete this site from the MMRP site list.

This area was originally identified as MSFC-082 in the 1991 Geraghty & Miller RFI Report. The CTT Range Inventory also shows that the shape of this site corresponds to the original MSFC-082 site. The MSFC-082 site has already been identified as a separate MMRP site, so this MSFC-003-R-02 site is a duplication.

CLEANUP STRATEGY

Complete SI. RI/FS is planned. Remedial Action is assumed including RD, Excavation, Off-Site Transportation and Disposal.

OE: Site Characterization and Removal Assessment and Removal Action are planned.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: High Risk

CONTAMINANTS OF CONCERN: UXO

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200210	200305
SI	200601	200712
RI/FS	200910	201009
RD	201510	201609
RA(C)	201610	201709

RC DATE: 201709

MSFC-077-R-01
MSFC-77

SITE DESCRIPTION

This site is not MMRP eligible. From aerial photography, this site shows no activity until the mid 1950s. All Army ordnance-related activities in this area ended in the mid-1940s. Therefore, we have no reason to believe that any MEC was ever handled or disposed of at this site. The historical record strongly indicates that this site is a burn/burial area for construction activities. The site boundary is consistent between the CTT Range Inventory and the IRP program.

CLEANUP STRATEGY

Complete SI. RI/FS is planned. Remedial Action is assumed including RD, Excavation, Off-Site Transportation and Disposal, Groundwater Extraction Wells, Metals Precipitation and Carbon Adsorption followed by 5 year review and O & M.

OE: Site Characterization and Removal Assessment is planned. Removal Action, Institutional Controls and Monitoring are anticipated.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: Serious

CONTAMINANTS OF CONCERN: UXO

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200201	200305
SI	200601	200712
RI/FS	200910	201009
RD	201510	201609
RA(C)	201610	201709
RA(O)	201710	203209
LTM	203210	204709

RIP DATE: 201710
RC DATE: 203209

RSA-001-R-01
HIGHWAY 565 AREA

SITE DESCRIPTION

The Highway 565 Area is the portion of RSA that was transferred from the northwest corner of the installation in the mid 1980s (specific date unknown) to the state of Alabama for the construction of Highway 565. The 49-acre area was once part of Area A, which was a high explosive ordnance drop area in the 1940's. The remaining portion of Area A within the current Redstone boundary is on an operational range complex, R1100 and is included in the inventory as RSA-71. In response to a November 16, 1984 memo to the Army from the Alabama State Highway Department, the Army determined "that the possibility exists that unexpended ordnance (live ammunition) may exist on all right-of-way on the project which was formerly Redstone Arsenal property." Prior to construction of the highway, the Army visually swept the area for UXO and ordnance related residue. The Army also agreed to provide safety training to highway workers and explosive ordnance disposal (EOD) support during the intrusive construction phase of the project. A complete subsurface survey was not conducted on the area prior to, during or after the construction. The extent of UXO or related materials remaining (if any) on the site is unknown. The site is considered a transferred range for the inventory because no longer owned or managed by the Army. The transfer of the area was not done under the FUDS Program, and the site is not listed in FUDS inventory. Highway 565 goes through the transferred area and is heavily traveled. There are no visual signs of its past use as a range area.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: Moderate Risk

CONTAMINANTS OF CONCERN: UXO

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200201	200305
SI	200601	200712
RI/FS	200910	201009
RA(C)	201610	201709

RC DATE: 201709

CLEANUP STRATEGY

OE Site Characterization and Removal Assessment are planned. Institutional controls are anticipated.

RSA-004-R-01
SMOKE GRENADE AREA

SITE DESCRIPTION

The data collection team located several historic maps of Redstone from 1946, which showed the location of a Smoke Grenade Area. The maps did not indicate the specific use of the area (e.g. testing, training, disposal or manufacturing). No other historic documents or references were located specifically regarding the area therefore, the exact use and history of the area is unknown. However, one historic memo from 1948 referenced 143,716 HC smoke grenades to be demilitarized at an un-named location on Redstone. The area is included in the inventory because there is a potential that it may have been used for munitions related purposes. The parcel is 14.3-acres and is located in a highly developed area south of Fowler Road and east of Mills Road.

The CTT Range Inventory mistakenly shows the MSFC boundaries to be much larger than the actual footprint. Because the MSFC boundaries were not correct in the CTT Inventory, this site was mistakenly identified as being located in the MSFC area. The actual location of this site, as shown in the CTT Range Inventory maps and 1949 maps, runs between building 5404 and 5410, which is not located on MSFC property. There was an area within MSFC boundaries called the grenade disposal pits, but documentation from 1949 indicates that this area was clean closed. The CTT Range Inventory captures that information and did not recommend the grenade disposal pits in the MSFC area to be an MMRP site.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: Serious Risk

CONTAMINANTS OF CONCERN: UXO

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200201	200305
SI	200601	200712
RI/FS	200910	201009
RD	201510	201609
RA(C)	201610	201709
LTM	201710	204709

RC DATE: 201709

CLEANUP STRATEGY

Complete SI. RI/FS is planned. Remedial Action is assumed including RD, Excavation, Off-Site Transportation and Disposal.

OE: Site Characterization and Removal Assessment is planned. Removal Action, Institutional Controls and Monitoring are anticipated.

RSA-141-R-01
RSA-141

SITE DESCRIPTION

The site is a 10.8-acre former mustard shell disposal area. Trenches were used to dispose (by burial) of unused mustard gas shells after WWII. 4.2-inch mortars were also documented at the site. The site is listed in the RSA IRP (Site No RSA-141) and is in the RI phase. The site is undeveloped. There were no trenches found at this site, it was a coal storage yard. Possible train derailment caused the UXO on the site. From the proximity of this site to the HVA Plant 1, along the rail lines, it is likely that the rail cars contained ordnance shells that had been filled in the plant and were being transported to the ROP to be fused. It is possible that this is CWM without fuses (no UXO). Approximately 20 chemically configured rounds have been removed from this area, none were fused. Two rounds of geophysics have been completed. The TCE groundwater contamination belongs to MSFC, no explosives have been detected in groundwater. NASA would like to build on this area ASAP.

STATUS

REGULATORY DRIVER: CERCLA

RAC SCORE: Serious Risk

CONTAMINANTS OF CONCERN: UXO

MEDIA OF CONCERN: Soil

Phases	Start	End
PA	200201	200305
SI	200601	200712
RI/FS	200910	201009
RD	201510	201609
RA(C)	201610	201709
RA(O)	201710	203209
LTM	203210	204709

RIP DATE: 201710
RC DATE: 204709

CLEANUP STRATEGY

Complete SI. RI/FS is planned. Remedial Action is assumed including RD, Excavation, Off-Site Transportation and Disposal, Groundwater Extraction Wells, Metals Precipitation and Carbon Adsorption followed by 5 year review and O & M.

OE: Site Characterization and Removal Assessment is planned. Removal Action, Institutional Controls and Monitoring are anticipated.

MMRP No Further Action Sites Summary

AEDB-R #	Site Title	Documentation/Reason for NFA	NFA Date
MSFC-082-R-01	MSFC-82	Combined with MSFC-003-R-02 due to possibility of CWM	200406
RSA-002-R-01	MSFC-3E	Combined with MSFC-003-R-01	200305
RSA-003-R-01	Rifle Range	This is an operational range (R0506), therefore not eligible for MMRP	200503
RSA-013-R-01	RSA-13	This is an operational range (R0702), therefore not eligible for MMRP	200406
RSA-014-R-01	RSA-14	This is an operational range (R0701), therefore not eligible for MMRP	200406
RSA-046-R-01	RSA-46	This is an operational range (R0505 and R0506), therefore not eligible for MMRP	200406
RSA-065-R-01	RSA-65	This is an operational range (R0701), therefore not eligible for MMRP	200406
RSA-066-R-01	RSA-66	This is an operational range (R0701), therefore not eligible for MMRP	200406
RSA-067-R-01	RSA-67	This is an operational range (R0701), therefore not eligible for MMRP	200406
RSA-068-R-01	RSA-68	This is an operational range (R0701), therefore not eligible for MMRP	200406
RSA-069-R-01	RSA-69	This is an operational range (R0701), therefore not eligible for MMRP	200406
RSA-070-R-01	RSA-70	This is an operational range (R0701), therefore no eligible for MMRP	200406
RSA-071-R-01	RSA-71	This is an operational range (Range R1101/1102/1103/1104/1105/1107), therefore no eligible for MMRP	200503
RSA-073-R-01	RSA-73	This is an operational range (R1104 /1105/1106/1107), therefore not eligible for MMRP	200503
RSA-074-R-01	RSA-74	This is an operational range (R1000 and R1107), therefore not eligible for MMRP	200503
RSA-110-R-01	RSA-110	This is an operational range (0701), therefore not eligible for MMRP	200406
RSA-132-R-01	RSA-132	This is an operational range (R0702), therefore not eligible for MMRP	200406

MMRP Schedule

Initiation of MMRP: 2003

Past Phase Completion Milestones
None

Projected ROD/DD Approval Dates: 2015+

Projected Construction Completion: 2017

Schedule for Five Year Reviews: TBD

Estimated Completion Date of MMRP including LTM: 2047

Redstone Arsenal MMRP Schedule

(Based on current funding)

AEDBR#	Phase	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15+
MSFC-003-R-01	SI									
	RI/FS									
	RD									201609
	RA(C)									201709
	RA(O)									203209
	LTM									204709
MSFC-003-R-02	SI									
	RI/FS									
	RD									201609
	RA(C)									201709
MSFC-077-R-01	SI									
	RI/FS									
	RD									201609
	RA(C)									201709
	RA(O)									203209
	LTM									204709
RSA-001-R-01	SI									
	RI/FS									
	RA(C)									201709
RSA-004-R-01	SI									
	RI/FS									
	RD									201609
	RA(C)									201709
	LTM									204709
RSA-141-R-01	SI									
	RI/FS									
	RD									201609
	RA(C)									201709
	RA(O)									203209
	LTM									204709

Total Funding up to FY04: $0K

FY05 Prior Year Funds

Site Information	Expenditures	FY Total
	$0K	**$0K**

Total Prior Year Funds: $0K

Current Year (FY06) Requirements

Site Information	Requirements	FY Total
SI, Installation-Wide	$ 397K	**$ 397K**

Total Future Requirements: $27,582K

Total MMR Program Cost (from inception to completion of the MMRP): **$27,979K**

Community Involvement

In 1994, Redstone Arsenal established a Technical Review Committee (TRC) to provide a forum for interested parties to discuss and provide input into restoration activities. This was in accordance with requirements outlined by 10 USC 27(c), Executive Order 12580, "Superfund Implementation" and Army Regulation 200-1.

Redstone Arsenal has conducted TRC meetings along with public availability sessions, environmental open houses, and public meetings to generate interest in the environmental program. A Community Relations Plan was also developed to assist in community involvement. During these community involvement efforts, Redstone solicited potential interest in forming a Restoration Advisory Board. Some of the tools used to solicit interest included RAB booths at public meetings, fact sheets, RAB sign-up sheets, comment cards and RAB applications. Currently, there is not enough sustainable community interest to establish a RAB. We will continue to solicit interest on an bi-annual basis.

The Community Relations Plan documents the chronology of historical events that RSA has conducted to solicit community involvement regarding environmental restoration efforts.

Public meetings were held on October 23, 2003 and again in October 2005. At these meetings, the public was solicited for interest in a RAB using a RAB booth, fact sheets, a RAB sign-up sheet, comment cards, RAB applications, and an oral presentation on RABs. Due to a lack of interest, no RAB was formed following these meetings. The next meeting to solicit interest in a RAB is planned for October 2007.